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OFFSHORE OIL AND GAS OPERATIONS SITE CLEARANCE AND RIG DISPOSAL

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Offshore Oil and Gas Operations Sit...

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RE THE

SUBCOMMITTEES ON OCEANOGRAPHY, GULF OF MEXICO, AND THE OUTER CONTINENTAL SHELF AND FISHERIES MANAGEMENT

OF THE

COMMITTEE ON
MERCHANT MARINE AND FISHERIES
HOUSE OF REPRESENTATIVES

ONE HUNDRED THIRD CONGRESS

FIRST SESSION

ON

WELL AND FACILITY REMOVAL AND SITE CLEARANCE FOR OFFSHORE OIL AND GAS OPERATIONS IN THE GULF OF MEXICO, AND EXAMINE THE RIGS TO REEFS PROGRAM

JUNE 29, 1993

Serial No. 103-39

Printed for the use of the Committee on Merchant Marine and Fisheries

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OFFSHORE OIL AND GAS OPERATIONS SITE CLEARANCE AND RIG DISPOSAL

TUESDAY, JUNE 29, 1993

House of Representatives, Subcommittee on Oceanography, Gulf of Mexico, and the Outer Continental Shelf, and Subcommittee on Fisheries Management, Committee on Merchant Marine and Fisheries,

Washington, DC.

The subcommittees met, pursuant to call, at 2:00 p.m., in room 1334, Longworth House Office Building, Hon. Solomon P. Ortiz (Chairman of the Subcommittee on Oceanography, Gulf of Mexico, and the Outer Continental Shelf) presiding.

Present: Representatives Ortiz, Manton, Green, Hamburg, Weldon, Coble, and Kingston.

Staff Present: Tom Kitsos, Senior Policy Analyst; Sue Waldron, Press Secretary; Sheila McCready, Staff Director; Robert Wharton, Professional Staff; John Aguirre, Clerk; Terry Schaff, Staff; Greg Gould, Staff; Greg Lambert, Counsel; Lori Rosa, Clerk; Frank Lockhart, Sea Grant Fellow; Chris Mann, Professional Staff; Jill Brady, Minority Professional Staff; Margherita Woods, Minority Professional Staff; Julie Roberts, Sea Grant Fellow; Ed Lee, Minority Professional Staff.

STATEMENT OF HON. SOLOMON P. ORTIZ, A U.S. REPRESENTATIVE FROM TEXAS, AND CHAIRMAN, SUBCOMMITTEE ON OCEANOGRAPHY, GULF OF MEXICO, AND THE OUTER CONTINENTAL SHELF

Mr. Ortiz. The hearing will come to order.

Good afternoon. I would like to welcome all of you here today on behalf of the Subcommittee on Oceanography, Gulf of Mexico, and the Outer Continental Shelf, and the Subcommittee on Fisheries Management.

Today the subcommittees meet to examine well and facility removal and site clearance procedures for offshore oil and gas operations in the Gulf of Mexico. In addition, information will be provided on the Rigs to Reefs Program, how it works, who is involved, as well as the advantages and disadvantages of disposing of offshore platforms in this manner.

In 1992, the Minerals Management Service in cooperation with the Gulf States revised their offshore site clearance procedures. I understand that these new procedures are designed to ensure that any structure installed on the Outer Continental Shelf is properly removed and the site cleared so as not to conflict with other uses of the OCS. With this hearing, I hope to obtain a better understanding of how these procedures work.

Associated with site clearance is the issue of end-of-lease costs and the concern about the growing number of smaller operators obtaining offshore leases in the Gulf of Mexico. The Minerals Management Service has issued a proposed notice of rulemaking raising the bonding requirements associated with exploration and production of offshore oil and gas resources. While this hearing will not focus on this issue, it is important to the subcommittee, and we would like to spend some time on this topic.

As part of our discussion on-site clearance, this hearing about also focus on the Rigs to Reefs Program within the Gulf of Mexico. While offshore oil and gas platforms in the Gulf of Mexico have occasionally impacted fisheries resources, they have also provided a man-made resource in the form of artificial reefs.

Since 1977, over 40 oil and gas structures have been converted into artificial reefs in Federal waters within the Gulf of Mexico, 17 of which are located in Federal waters off of the coast of Texas. With this hearing, we hope to gain a better understanding of both the Federal and State roles in the program, and hopefully arrive at a consensus on how this program should be administered to maximize the benefits it provides, while minimizing possible concerns.

Now, we have Chairman Manton, who is on his way from another meeting; and the Ranking Member, Mr. Weldon, is also on his way. We would like at this time to include their statements into the record, and the statement of Mr. Fields and any other Member who would like to include their statement for the record.

[The statements mentioned follow:]

Statement of Hon. Thomas J. Manton, a U.S. Representative from New York, and Chairman, Subcommittee on Fisheries Management

Good afternoon and welcome. Today, we examine the use of offshore oil rigs as artificial reefs.

In recent years, as many offshore oil rigs have reached the end of their economic lives, there has been a movement to convert these rigs into artificial reefs. Because these reefs attract large numbers of fin fish, this conversion has been enthusiastically welcomed by recreational anglers. However, others in the fishing industry, such as shrimp vessel operators, are very concerned about the potential for snagging their trawls on these underwater structures.

Significant evidence exists that these reefs increase fish production and that the rigs act as "magnets" attracting larger fish that feed on the smaller organisms that flourish around the rigs. Unfortunately, these converted rigs do not diminish the serious problems associated with lost coastal nursery habitat essential to the early development of fin fish and shrimp. Because the creation and maintenance of habitat is a key component of any fishery management plan, the use of converted rigs to improve habitat greatly interests the Subcommittee on Fisheries Management.

This hearing brings together affected parties to examine the risks and benefits of using discarded oil rigs as reefs. Clear benefits of this program are that the oil and gas industry may eliminate some dismantling costs and fishery managers can create valuable reef habitat.

The challenge is to ensure that the conversion of rigs to reefs does not harm the environment or create unreasonable obstructions to established fishing operations.

This hearing by focusing on one means to develop habitat will assist our Subcommittee as we move forward to reauthorize the Magnuson Fishery Conservation and Management Act. I thank my distinguished colleague, Chairman Solomon Ortiz, for joining me in this joint hearing.

STATEMENT OF HON. JACK FIELDS, A U.S. REPRESENTATIVE FROM TEXAS, AND RANKING MINORITY MEMBER, COMMITTEE ON MERCHANT MARINE AND FISHERIES

Mr. Chairman, I am pleased that you have called this hearing today on the artificial reef program—a program that benefits business and the environment.

As many of us from the Gulf area know, oil and gas platforms have provided a place for many shellfish and other fish to gather. The legs of rigs are covered with various mollusks and have become a breeding ground for many species of fish. It is not surprising that rigs which have outlived their use as a drilling platform are now being used as artificial reefs. Consequently, the artificial reef program has saved money for those oil companies that have participated in the program.

In addition, artificial reefs have been shown to greatly benefit the environment. The reefs are providing much needed habitat for countless fish populations. Research on new materials and positioning of the reefs continues in an attempt to see if these artificially created reefs can do the same job as natural reefs to enhance certain fish species. Preliminary results are very promising.

While this program has much to recommend it, it is imperative that the reefs are adequately marked and do not pose a threat to other users of the same offshore areas. We will hear testimony today that shrimpers in the Gulf have had problems catching their nets on unmarked obstructions, either reefs or uncleared oil production sites. If the site clearance program and artificial reef programs were working as they were intended, such problems would not exist. I only hope that these problems are not commonplace. A successful program must ensure that the users of our offshore areas are compatible with each other.

Again, Mr. Chairman, thank you for calling this hearing and I look forward to hearing from our witnesses.

STATEMENT OF HON. CURT WELDON, A U.S. REPRESENTATIVE FROM PENNSYLVANIA, AND RANKING MINORITY MEMBER, SUBCOMMITTEE ON OCEANOGRAPHY, GULF OF MEXICO, AND THE OUTER CONTINENTAL SHELF

Mr. Chairman, I am pleased that you are holding this hearing today on well and facility abandonment and site clearance for offshore oil and gas operations in the Gulf of Mexico. I look forward to hearing from our witnesses on programs designed to ensure that well rigs are removed or reused without long term adverse impacts to our natural environment.

As you know, Pennsylvania does not have an offshore oil and gas program. In recent years, however, the state has developed an artificial reef program, looking specifically at how they may impact fish habitat.

In 1989, a number of wetland acres were developed along the Delaware Estuary. As a result, the Army Corps of Engineers and the Environmental Protection Agency initiated an artificial reef program as a means to offset the loss of wetland habitat. While this project is still in its early stages, preliminary reports have shown that artificial reefs have been very successful.

While I am pleased to learn of the success of this program, I do feel that there are questions that need to be asked to ensure that programs such as the Rigs to Reef Program and state developed artificial reef programs are successful.

This would include examining how effective artificial reefs are in creating useful fish habitat and what are the adverse effects of replacing natural habitat with submerged rigs or concrete artificial reefs? Furthermore, I also feel that it is important to explore who should pay for these programs and who benefits from them. Finally, should we be concerned that too many artificial reefs exist and that they may, in fact, have long term effects on the environment?

I hope that our witnesses are able to address these and other similar issues at our hearing today. Again, Mr. Chairman, thank you for holding this important hearing. As always, I look forward to working with you and the other Members of the Subcommittee on this and other matters of importance in the upcoming months.

Mr. ORTIZ. Let me introduce our panel which consists of representatives from the administration, the State of Texas, and the commercial and recreation fishing industry. First, Mr. Henry Bartholomew, Deputy Associate Director for Operations and Safety Management for the Minerals Managements Service. Mr. Bartholomew directs development and promulgation of regulatory policies governing the offshore safety and environmental protection.

Mr. John Hall is Chief of the Habitat Policy and Management Division of the National Marine Fisheries Service.

Next is Mr. Sheldon Fortenberry, Manager of Offshore Design and Construction for Chevron Petroleum Technology Company. Mr. Fortenberry is testifying often behalf of the National Ocean Industries Association, the Offshore Operators Committee, and the American Petroleum Institute.

Mr. Hal Osburn is Director of the Artificial Reef Program for the State of Texas Parks and Wildlife Department. Mr. Osburn has conducted extensive field research throughout the Gulf of Mexico and coauthored the Texas Artificial Reef Plan and is testifying on behalf of the Gulf States.

Next is Ms. Wilma Anderson, Executive Director of the Texas Shrimp Association, an association representing a majority of the Texas offshore shrimp trawlers, and a number of shrimp trawlers from other Gulf States.

Last but certainly not least is Ms. Tina Berger. Ms. Berger serves as Director of the Artificial Reef Development Center and is a research specialist at the Sports Fishing Institute.

I welcome all of you to this committee, and I am very happy that all of you could make it this afternoon.

Before we begin, I would like to remind the witnesses that their entire testimony will appear in the record, and to try to limit their oral testimony to five minutes if possible, as indicated by the lights at the witness table. They are not traffic lights.

So, Mr. Bartholomew, will you begin your testimony at this time, please, sir.

STATEMENT OF HENRY BARTHOLOMEW, DEPUTY ASSOCIATE DIRECTOR, OPERATIONS AND SAFETY MANAGEMENT, MINERALS MANAGEMENT SERVICE

Mr. BARTHOLOMEW. I will be happy to, Mr. Chairman. Thank you.

My name is Henry Bartholomew, and I am Deputy Associate Director for Offshore Operations and Safety Management in the Minerals Management Service. The committee has my written statement for the record, and I will try to keep my remarks to under five minutes.

MMS, or the Minerals Management Service, is the Federal agency that has the primary responsibility for assuring safe and clean oil and gas operations on the Outer Continental Shelf. I appreciate the opportunity to testify today on one of the really key elements of that program, our Lease Abandonment Program.

The goal of the Lease Abandonment Program is twofold: to ensure safety and environmental protection as we do throughout the OCS, and to minimize interference with other uses of the OCS.

Before abandoning a lease, a Federal lessee is required to plug and permanently abandon all wells, to remove all structures and associated equipment, and clear the seafloor on the lease site of any obstructions. We may require the lessee to make changes in his abandonment plan before approving it. We also conduct on-site spot inspections to make sure the lessee has been in compliance with this plan and with our regulations.

Generally the first step in the process is well abandonment. The most important step in abandoning a well is plugging the well, a process in which the lessee installs a series of cement and mechanical plugs designed to prevent fluid flow and leakage. One of those plugs is a surface plug, a cement plug that may be at least 150 feet long and, when installed, its upper end is within the first 150 feet below the seafloor. Other plugs isolate oil and gas producing zones from other producing zones, from freshwater aquifers, and from the seafloor and the ocean.

Generally the last step is to remove a wellhead, cut off all remaining casing, tubing, and all other obstructions to at least 15 feet below the mud line. The district supervisor may authorize departures from this requirement if the remaining seafloor obstructions will not interfere with other legitimate uses of the area.

Lessees must also remove platforms, caissons, and pilings to a depth of at least 15 feet below the mud line. They may use explosives or mechanical means for severing structures. When using explosives, they must provide suitable protection for endangered species.

Finally, we require verification of the effectiveness of the clearance operations. This is done typically by trawling the seafloor in the area of the platform or well site, or, alternatively, conducting a sonar survey around abandoned well and platform sites.

We have set forth procedures for site clearance verification in our regulations and in our May 1992 NTL, or Notice to Lessees and Operators that you cited in your opening remarks, Mr. Chairman. The NTL sets forth recommendations developed by a broad-based committee that included representatives from the oil and gas industry, from the shrimping industry, the State of Louisiana, Jefferson Parish, Louisiana, and the Minerals Management Service. I have described those procedures in some detail in my written statement and I can provide the committee with additional documentation.

Although others on this panel are much more knowledgeable, before closing I wanted to comment briefly on the Rigs to Reef Program. Under that program, lessees may donate platforms to the coastal States. This allows the continued use of offshore structures to benefit and enhance marine life. States, however, play the major role in planning and developing artificial reefs. The MMS serves as a source of information for the States, other Federal agencies, and the offshore oil and gas industry.

In closing, may I reiterate the objectives of our Lease Abandonment Program, which are to ensure safety, protect the environment, and facilitate other uses of the Outer Continental Shelf. We believe that program has been effective. However, we welcome the opportunity to work with the two subcommittees on any improvements that may be identified as a consequence of these hearings.

I would like to comment on the end-of-lease cost and bonding arrangements that the Chairman noted. It might be better if I wait until the question and answer session, where I will have more time to go into more detail on that.

Thank you, Mr. Chairman.

[The statement of Mr. Bartholomew may be found at end of hearing.]

Mr. Ortiz. Thank you.

If you have any other material to accompany your statement, it will also be included in the record.

Mr. Hall.

STATEMENT OF JOHN HALL, DIVISION CHIEF, HABITAT POLICY AND MANAGEMENT DIVISION, NATIONAL MARINE FISHERIES SERVICE, ACCOMPANIED BY RONALD L. SCHMIED, SPECIAL ASSISTANT FOR RECREATIONAL FISHERIES; AND CHARLES L. COOPER, FINANCIAL SERVICES DIVISION

Mr. Hall. Mr. Chairman and Members of the subcommittee, my name is John Hall. I am chief of the Habitat, Policy and Management Division, National Marine Fisheries Service, National Oceanic and Atmospheric Administration in the U.S. Department of Commerce.

I have with me today Mr. Ron Schmied, a Special Assistant for Recreational Fisheries, and Mr. Charles Cooper, who for the last 12 years has specialized in fisheries contingency fund matters. For technical questions I would like to be able to ask them to provide direct responses.

What about the Rigs-to-Reef Program? Discussions on the Rigs-to-Reef Program were initiated in the early 1980's to explore options for reusing obsolete oil and gas structures in the construction of artificial reefs. Most of these discussions focused on the Gulf of Mexico area where roughly 95 percent of these offshore structures were located.

At the outset, NMFS attempted to build consensus on the use of obsolete structures in related marine programs. Three factors were very important. First, we were aware there were about 4,000 offshore structures in the Gulf of Mexico constituting perhaps the largest de facto artificial reef system in the world. A typical structure in 150 feet of water can provide up to two acres of substrate, which is extremely important for certain kinds of marine fisheries.

Research has confirmed that offshore structures play a vital role in the dramatic growth of recreational and commercial fisheries in the Gulf of Mexico, especially offshore Louisiana and Texas. Information gathered from the National Marine Fisheries Service through its statistics survey shows that offshore structures are destinations of 37 percent of all salt water commercial fishing trips. Texas results were similar, over 28 percent were to offshore structure locations.

The third motivating factor was a growing concern over the large number of structures proposed for removal and the impacts on marine fisheries that could possibly occur. The National Research Council projected by the year 2000, two-thirds of the existing offshore structures will have become commercially unproductive and subject to removal and disposal. Over 90 percent of the 1600 structures likely to be removed from Louisiana offshore waters would be from water less than 100 feet deep.

As a result of such concerns, our colleagues in the Minerals Management Service undertook steps to identify the use of offshore structures. A number of items surfaced. Number one, there was a general absence of general policy regarding rigs to reefs.

Number two, there was public concern that a Rigs to Reef Program would allow oil and gas companies to sidestep removal requirements, creating an offshore dumping ground.

Three, it was unclear whether current law would allow on-site conversion to artificial reef use or if complete physical removal of a structure was still required.

Number four, oil and gas interests were concerned that a rigs to reef process would leave them with unacceptable liability exposure, and that converting to reefs may prove more costly.

Number five, the commercial trawling industries were concerned about fishing gear damage.

Six, there were real concerns about how the States and the Federal Government would interact in an appropriate manner regarding permitting and marking requirements for artificial reefs.

The objectives were advanced appreciably with passage of the National Fishing Enhancement Act of 1984. Through NFEA, Congress recognized the many advantages and mandated the Secretary of Commerce to develop a national artificial reef plan and establish an artificial reef regulatory activity under the Corps of Engineers.

Both Texas and Louisiana's artificial reef programs are good examples of States working in concordance under the NFEA. In Louisiana, the Artificial Reef Council evaluates proposals for rigs to reefs conversion. The donor company complies with all the removal requirements at the original site, transfers the structure to the site and deploys a system of State and Federal requirements.

At this point in the process, title to the structure transfers to the State. If the donor realizes a cost saving from this method of disposal, a specified portion of the saving is transferred to a State trust fund for operation of the Louisiana program. As long as requirements are met, the donor company at that point is absolved of the future liability claims.

There are also protected species considerations. The removal of obsolete oil and gas rigs has the potential for marine mammals to be adversely affected. Both Corps of Engineers and MMS consult with the National Marine Fisheries Service under Section 7 of the Endangered Species Act. The full statement details conditions that are applied under these circumstances.

Over 525 structure removals have been observed by NMFS and there have been no documented mortalities of sea turtles or injury or mortalities of marine mammals. One sea turtle was found with a split carapace. It was captured, rehabilitated and later released.

The last point I would like to touch on is the Fisheries Contingency Fund. The FCF was authorized by Title IV of the Outer Continental Shelf Lands Act Amendments of 1978. It has been around a while. It mitigates conflicts between the fisheries and energy industries by compensating fishermen for casualties caused by energy-related debris. The FCF program compensates eligible casualties for 100 percent of gear replacement or repair cost, vessel replacement or repair costs not to exceed a reasonable insurance deductible whether or not insurance is in force, and 50 percent of the gross economic loss from the time of the casualty or the date the vessel could reasonably have been repaired or replaced.

Fishermen are afforded a presumption that their casualties are caused by oil and gas caused obstructions if they make a report of the casualty to the program office within 15 days after returning to port. Otherwise, they have to prove that the obstruction was related to oil and gas activities. The program is totally self-supporting through assessment of energy companies.

Mr. Chairman, this concludes my written testimony. I thank you for this opportunity to offer our views on oil well facility abandonment and the Rigs-to-Reef Program. I would be pleased to respond to any questions you or Members of the subcommittees may have.

[The statement of Mr. Hall may be found at end of hearing.]

Mr. ORTIZ. Thank you, Mr. Hall.

Mr. Fortenberry.

STATEMENT OF SHELDON FORTENBERRY, MANAGER OF OFFSHORE DESIGN AND CONSTRUCTION, CHEVRON PETROLEUM TECHNOLOGY COMPANY

Mr. FORTENBERRY. Yes, Mr. Chairman, I am Sheldon Fortenberry, Manager of Chevron's Offshore Design and Construction Group. I am here today on behalf of the National Ocean Industries Association, the Offshore Operators Committee, and the American Petroleum Institute. NOIA represents approximately 260 companies; the OOC represents approximately 93 companies, and the API represents 300 companies. Although there is some duplication in membership, combined, these companies are involved in all aspects: exploration, production, transportation, refining and marketing.

We appreciate the opportunity to participate in this hearing regarding well and facility abandonment and site clearance for offshore oil and gas operations in the Gulf of Mexico. We are also pleased to address the rigs to reef issue because it illustrates the benefits of government and industry working together to accomplish a common goal.

API estimates that 60 structures will be removed from the Gulf of Mexico in the next five years. Removal of offshore platforms becomes necessary when oil and gas production ceases in the last producing well.

As illustrated in figure 1, a typical platform consists of a deck or superstructure, which supports the facility's equipment, a jacket which extends from the mud line to above the water surface and supports the deck, and piles that support both the deck and jacket.

Planning for removal and reefing is an option, is carried on concurrently with the approval process. A site clearance procedural plan is submitted to the leaseholder with the permit and application for platform removal. Upon receipt of the approvals, wells are plugged and abandoned.

Prior to removal, each platform is decommissioned, which typically involves purging and draining vessels and pipelines, removing facilities, and severing the wells a minimum of 15 feet below mud line. A contractor experienced with platform removals is hired to remove the platform. The platform is removed prior to severing the piles.

Bulk explosives, mechanical and abrasive cutters are all methods used in cutting the piles. After severing the piles, the jacket is removed either in one piece or in smaller sections.

Site clearance procedures at depths less than 300 feet require trawling 90 days after platform removal. Trawling is typically performed by an approved local shrimping boat accompanied by an onboard surveyor. Our industry is responsible for leaving each site clear so as not to conflict with other uses of the OCS.

While current techniques are effective, we are concerned that some requirements associated with the application of these techniques are too conservative. In particular, the OOC has provided data to the MMS that supports significant smaller area requirements for site clearance surveys. Implementing smaller site clearance requirements would reduce industry costs with minimal environmental impact.

The Rigs to Reef Program as developed by each State has been well received by our industry. Each of the Gulf States that show an interest in receiving platforms are reef candidates. Since the beginning of the program, approximately 70 structures will have been referred in the Gulf of Mexico by the end of this year.

On the rare occasion where decks are reefed, they are typically stripped of facility equipment leaving only the structural steel as an item to be reefed. These steel structures have been in the Gulf waters for some time, 30 years or longer, before being removed.

We see no pollutant-related environmental concerns over using these structures as artificial reefs. In fact, we believe our reefing these structures versus removing them would make a positive contribution to the environment.

We would like to compliment the agencies involved in the approval and monitoring process for the Gulf of Mexico for both the abandonment and site clearance work as well as the artificial reef programs. These procedures have evolved along with the increase in abandonments and we expect these procedures will continue to evolve. Our industry wants to continue to participate in the process of redefining these procedures.

Thank you for the opportunity to testify. I will be happy to answer any questions you may have.

[The statement of Mr. Fortenberry may be found at end of hearing.]

Mr. ORTIZ. Thank you, sir.

Mr. Osburn.

STATEMENT OF HAL OSBURN, DIRECTOR, ARTIFICIAL REEF PROGRAM, TEXAS PARKS AND WILDLIFE DEPARTMENT

Mr. OSBURN. Mr. Chairman and Members, my name is Hal Osburn. I am the Artificial Reef Program Director with the State of Texas, as well as Chairman of the Gulf States Marine Fisheries Commission Subcommittee on Artificial Reefs.

The basic message I have for you today is that the National Fishing Enhancement Act of 1984, which initiated the development of the national artificial reef plan and the rigs to reefs movement, has been an overwhelming success. This guidance provided to fishery managers has produced benefits throughout America's coastal States. Those benefits can be summarized as enhanced fisheries resources, increased opportunity for commercial and recreational fishing and sport diving.

Man's impact on our marine resources has been tremendous. Artificial reefs have proven to be one of several management tools that help regain lost ground. Virtually every coastal State uses artificial reefs to help accomplish their individual fishery management goals.

In the Gulf, Florida, Alabama and Mississippi each have extensive areas permitted for artificial reefs. Primary materials used are derelict ships and construction materials, although some rigs have also been placed.

Louisiana and Texas, on the other hand, are fortunate to have an abundance of petroleum structures that already serve as unintentional artificial reefs. Habitat limited and overfished reef fish stocks have benefited greatly from these hard substrate oases. The Rigs to Reefs Programs seek, in essence, not to create new artificial reefs, but rather to preserve those that already exist.

The rigs to reefs process works by having the State apply for a permit to create an artificial reef from the Corps of Engineers. Strict public comment periods and other siting criteria apply to each rig placement.

Having acquired the necessary permits, the State and the petroleum company sign a deed of donation which specifies the conditions of transfer of the rig. The rig may be toppled in place or it may be towed to another location. If towed, the normal site clearance rules still apply to the original location.

The deed also specifies a contribution of 50 percent of the realized savings from having donated the rig versus taking it to shore for scrap. These moneys are used to cover the cost of administration, buoy marking, and possible liability costs.

In Texas, however, our program goes beyond toppling rigs offshore. Because we have deeper, clearer water closer to shore, we also strive to create new fishing and diving sites which will be more accessible to the major ports.

The desire for more usable reefs has been clearly expressed by the tourism, fishing and diving industries in Texas who feel they have not adequately benefited from the Gulf's resources. It was these groups who supported the development of a Texas artificial reef plan modeled after the national plan.

A unique feature of the Texas plan was the creation of a citizen advisory committee to provide a high-level forum to discuss differences on implementing the plan. Members of that advisory committee include shrimpers, environmentalists, petroleum engineers, fishermen and divers.

Conflicts that have risen have revolved around the slow pace of creating near-shore reefs and the loss of trawlable bottom by the shrimp fleet. The first conflict is really a matter of money. But the rigs to reefs monetary donations have already provided substantial funds to begin addressing these needs.

The conflict involving trawlable bottom has also yet to be fully resolved, although meetings are being held coastwide with Gulf shrimpers to identify specific areas of concern. Although compromises have been made with the shrimping community, it must also be recognized that moderate artificial reef development will not represent any significant loss of trawlable bottom. In fact, out of 13 million acres of trawlable bottom off Texas, artificial reefs currently only take up 1800 acres or less than 0.1 percent.

Preservation of this valuable habitat will lessen the overfishing problems with red snapper caused in part by the shrimp fleet bycatch of juvenile fish.

Shrimping is important in Texas, but so is tourism and fishing and diving. User groups who profit from publicly owned marine resources must be prepared to share those resources to help achieve maximum benefits for all people. Artificial reefs can make a much needed contribution to achieving these benefits.

Thank you. I will be happy to answer any questions.

[The statement of Mr. Osburn may be found at end of hearing.]

Mr. ORTIZ. Thank you, sir.

Now, Ms. Wilma Anderson.

STATEMENT OF WILMA ANDERSON, EXECUTIVE DIRECTOR, TEXAS SHRIMP ASSOCIATION

Ms. ANDERSON. Thank you, Mr. Chairman, Members of the committee.

My name is Wilma Anderson. I am Executive Director of the Texas Shrimp Association. I am also a vessel owner of those trawlers that operate in the Gulf of Mexico.

The association represents the majority of the Texas offshore trawlers and a significant number of vessels from Florida to Texas that belong to our association. We appreciate the invitation to present comments before the subcommittee on the well and facility abandonment and the site clearance pertaining to the offshore oil and gas operations in the Gulf of Mexico. Also, the Rigs to Reefs Program advantages and disadvantages of disposing of offshore oil and gas platforms in this manner.

I would like to take the time of the subcommittee to briefly put an analysis of where the shrimp industry comes from and the unfortunate activities now affecting us today.

As many of you are aware, the shrimp industry is the most valuable fishery in the United States, of which the Gulf of Mexico represents the majority of that value, and of that value comes from Texas and Louisiana. Texas leads in value, Louisiana leads in volume, and with the combination of the two we have over 80 percent of the U.S. economic value of the U.S. shrimp industry.

Most of these rigs as stated prior is off Texas and Louisiana. Our trawlers are designed and equipped for long-range mobility and mode of operation range from Florida to Texas. All frequent the same fishing grounds, encounter the same favorable and detrimental factors. When an area of the Gulf is affected, the entire Gulf shrimp fleet is affected.

For decades the shrimp fishery has utilized the vast fishing grounds and commercially harvested the yield of a yearly renewable resource. If shrimp is not harvested within its yearly life cycle, it has lost its economic value. It is not a depletable reserve, such as oil and gas production.

As the extractive resource diversity of the Gulf unfolded, the traditional fishing grounds of the trawlers became concentrated into limited production areas, from the encroachments of diversity for navigational shipping of crude, petrochemicals, commodities, and the expanding placements of offshore oil and gas activities.

It was our original understanding as we coexisted with the offshore drilling and gas and oil, that once the wells and the platforms were complete, they would be removed, brought back to shore, and our traditional fishing grounds would be returned. That changed with the National Fishery Enhancement Act, and in a changing economy now affects offshore facilities resulting in lease transfers from majors to independents.

We are concerned about the independents. Financially, are they going to leave the wells, are they going to leave the facilities, are they going to leave the pipelines, and what do we have in environmental factors in the Gulf and the productive shrimp fishing grounds that we do not now have access to? We are sitting on the sidelines while we wait for all these decisions to be made.

In addition is the concern of the shrimp fishery in the Rigs to Reef Program that has resulted in retaining in place toppled nonproductive facilities, and further loss of fishing grounds through replacements inconsistent with a shrimp fishery, the loss of Title IV, Fishermen's Contingency Fund, under the 1978 OCS Lands Act Amendment. Once these rigs are transferred to a permitting, the Title IV Fishermen's Contingency Fund goes void. We still have exposure to fishing gear in the Gulf of Mexico. The use of a general permit for rigs to reefs by the Corps of Engineers will now avoid input from the public, and the inadequate co-management of the Rigs to Reefs Program, no one seems to be talking about. We want to know what is going on with these fishery plans out there.

Too many areas remain unanswered, improperly managed as the shrimp industry waits. We would like to make recommendations for consideration and review.

On the well and facility abandonment site clearance, we would like to see the same guidelines remain as what they have been since the 1992 provisions. It is important that the site clearance occurs. It has tremendous cost to us if we have loss of fishing ground.

We would really like to see the platforms and the wells and all structures we moved and returned to the shore site, either salvaged, recycled, and the productive fishing grounds returned.

In consideration of the extensive amount of platform and rig removals in the near future and the resulting mass of species killed from explosive use in the Gulf of Mexico, the shrimp fishery recommends a complete surveillance during the use of explosives and continued surveillance of offshore, end shore and shore side for several days following the detonation.

The Gulf turns are a related factor for the area of strandings. The fishery maintains this is a necessity in order for the shrimp fishery to avoid exposure of nonrelated mortalities of endangered and threatened species. Our concerns relate to the revised regulations, which contain a clause that if there is an area of heavy turtle strandings, that area is subject to closure for shrimp fishing.

We would like to make sure we will be clearing and bringing back out of the Gulf what should not be there. On the Fishermen's Contingency Fund, the Gulf of Mexico has a vast amount of offshore drilling facilities of oil and gas. The majority of these, as I said, is off Louisiana and Texas.

One must consider that from the vast activities there will be substantial material lost overboard from the platform structures, barges, removals, and hurricanes' scattered damage. This does create obstructions for the shrimp trawlers which incur damage to the trawlers and the loss of fishing time to return to port.

The shrimp industry and the offshore facilities have worked cooperatively with the understanding that capped wells will be properly marked, pipelines and material debris will be recovered and/or removed to minimize fishing gear loss to the trawlers. In the event that obstructions result in gear damage, trawlers were compensated through the Title IV Fishermen's Contingency Fund.

Under the Rigs to Reef Program, it is probably the most controversy that exists between the fishery and the other sectors. We feel that it is not in full compliance to work for the shrimp industry. We are not against fishery enhancement for all user groups. But is that enhancement must be beneficial and properly managed to avoid user conflicts.

We do feel that the present Rigs to Reef Program is not in compliance with the National Fishing Enhancement Act of 1984 and planned development, fishery management procedures, and standards 1 through 4.

We feel that Fishery Management Council has been negligent, or perhaps I should state, appear unaware if they have a mandate to participate. Perhaps it is they don't have the funding or hasn't been part of the funding, but every time it is brought up, they rather ignore rigs to reef. Other than one special management zone that we objected to and the plan was recalled, it was designated as a special management plan for red snapper fishermen.

Our experience with the Texas program is, and my friend next to me, Mr. Osburn, would call it the dash for the cash. We do have a 10-member committee. We have one representative that serves on that committee. We are constantly outvoted on the siting, the toppling, and therefore we are in opposition.

We would like to see under the Rigs to Reef Program that the Title IV contingency fund be brought forward into the Rigs to Reef Program under the National Fishing Enhancement Act and be part of it through funding of the active offshore industry and through the donation funding through to the State agencies.

I know my time is up, Mr. Chairman. I will go ahead and answer any questions you have.

[The statement of Ms. Anderson may be found at end of hearing.]

Mr. ORTIZ. Thank you.

We have a vote, but I think what we would like to do is finish with the last witness, Ms. Berger, and after she finishes with the testimony, we can go vote and come back and then ask questions.

We are happy to be joined by Chairman Manton today, Mr. Green, and of course the Ranking Member, Mr. Weldon.

Ms. Berger.

STATEMENT OF TINA BERGER, MANAGING DIRECTOR, ARTIFICIAL REEFS DEVELOPMENT CENTER, SPORT FISHING INSTITUTE

Ms. BERGER. Thank you, Chairmen Ortiz and Manton, and the subcommittee Members, for providing this opportunity to express the views of the Sport Fishing Institute on the successful implementation of the national artificial reef plan and Rigs to Reefs Program.

I am Tina Berger, Director of the Artificial Reef Development Center and marine research specialist at the Sport Fishing Institute. For over three years I have been involved in the compilation and assessment of artificial reef development, management and research activities throughout the coastal United States.

For nearly a decade, the Sport Fishing Institute has been a key player in the formulation of the national policy on artificial reefs, and in the subsequent implementation of this policy at the Federal, regional and State levels.

Over the next few minutes, I would like to leave you with an idea of the magnitude of the social, economic and environmental benefits that artificial reefs and artificial reef programs, such as rigs to reefs, provide to the nation.

As importantly, I would also like to leave you with an understanding that these benefits are the result of the well thought out and coordinated planning and management strategies of local, State, regional and national natural resource managers.

Artificial habitat, whether it be intentionally placed artificial reef or platform, has been found to attract large numbers of pelagic fish and increase local production of many other species of fish. For many high-profile habitats such as petroleum platforms and reefs composed of large vessels, fish can be found in concentrations of 20 to 50 times greater than in nearby soft-bottom areas. It is for these reasons that artificial reef habitats have been especially important in a region such as the Gulf of Mexico, where natural hard bottom is at a minimum.

In Louisiana alone, it is estimated that artificial habitat, both petroleum platforms and permitted artificial reefs, constitute over 90 percent of all hard-bottom habitat in waters less than 300 feet deep. Gulf-wide, artificial reefs are estimated to account for 30 percent of all hard-bottom habitats. The contributions of this habitat to the availability and perpetuation of the region's fishing resources are considerable.

In addition, artificial reefs provide enormous benefits to the local economies of coastal communities. We have estimated that in 1991 marine recreational fishing activity generated nearly $17.6 billion to the national economy, including $4.5 billion in wages and salaries.

Clearly, marine recreational fishing provides immense benefits to the social and economic well-being of the entire nation, with artificial reefs playing an important role in providing these benefits. In 1990 alone, an estimated 1.64 million marine recreational fishing trips were made to over 670 permitted artificial reef and petroleum platform sites located throughout the coastal United States. Based on average expenditure per trip data for 1991, this artificial-reef-related fishing activity generated angler expenditures of $127.7 million each year.

These benefits and opportunities, however, do not simply occur overnight. Rather, it has been through the combined efforts of a strong constituency of recreational anglers and divers and dedicated State, interstate, and Federal resource agencies that have made artificial reef development and management in the coastal United States a reality.

Although artificial reef development has occurred since the early 1960's, it was not until the passage of the National Fishing Enhancement Act of 1984 and the subsequent implementation of the National Artificial Reef Plan in 1985 that artificial reefs became formally recognized as an important component of marine fisheries conservation and management.

Since that time, the National Artificial Reef Plan has served as a centerpiece around which all marine artificial reef development, management and research activities have revolved. In less than eight years since the plan's development, 19 out of 23 coastal States have active artificial reef programs; 12 of these 19 States have or are in the process of developing Statewide artificial reef plans. Developed through extensive consultation with other State agencies, academia, industry, and all affected user groups, each plan reflects the needs of the individual coastal States while based on the guidelines and requirements outlined by the national plan.

Again, fundamental to each State program and plan is the goal that artificial reefs be used to enhance and conserve fishery resources, facilitate use by both commercial and recreational fishing interests, minimize conflicts and risks while limiting the effects of fishing pressure and overexploited stocks.

States have also played a very important role in the formulation of regional artificial reef policies and initiatives through the auspices of the Atlantic and Gulf States Marine Fisheries Commission. The Rigs to Reefs Program provides one example of such an initiative. Through the program, managers have worked to retain an already valuable habitat in the Gulf by converting obsolete petroleum platforms into artificial reefs.

It is important to note, however, that the Rigs to Reef Program is just one component in the region's overall artificial reef activities. It serves a valuable purpose because it is within the context of an overall well-designed and larger national Artificial Reef Program.

Thank you for letting me express the views of the Sport Fishing Institute, and I would be happy to answer any of your questions.

[The statement of Ms. Berger may be found at end of hearing.]

Mr. ORTIZ. Thank you.

We will recess for about five minutes. Chairman Manton is voting. When he returns, we will resume the hearing and the questions.

[Recess.]

Mr. MANTON. [Presiding.] Thank you for your patience. Mr. Ortiz asked that we start so that we can save everybody some time. He will be back, I understand.

My name is Tom Manton. I am Chairman of the Fisheries Management Subcommittee. We are sort of having a combined hearing here today.

I guess this is for anybody on the panel. Are these rigs adequately pinpointed on navigational charts so that everybody knows where they are, or not?

Mr. OSBURN. Yes, sir. In virtually every case artificial reefs require a permit from the Coast Guard to buoy that site until it is adequately marked on the NOAA nautical charts. It takes about 18 months. So it either has a buoy or it has specific loran or lat-longs. And in Texas we provide specific information about the 20 sites that we have to the shrimping community and other user groups on a regular basis.

Mr. MANTON. You say the 20 sites in Texas?

Mr. OSBURN. Yes, sir, a total of 20. That includes some of our Liberty Ship sites put down in the 1970's and some other sites that do not have rigs on them at this time. We have got about 10 sites that have rigs on them, 17 rigs altogether, but a total of 20 sites in our program.

Mr. MANTON. How about in Louisiana, how many sites do we have there, if someone can answer that?

Mr. OSBURN. They have a total of about 25 sites, with 40 some rigs on those sites.

Mr. MANTON. The oil rigs are just toppled, they are not cut in any way into smaller components, if I understand it.

Mr. OSBURN. If the water depth is right, you can cut it 15 feet below the seafloor, I believe is what is required by MMS, and then you can topple that in place or two to a site that has the correct water depth above the structure, depending on whether you are willing to buoy it long-term or not.

In Texas we have several of our rigs that have been cut to obtain the correct water depth. In other words, there had to be a 50-foot clearance. Without cutting, it would have only been 40 foot, so we had to cut it, and we have spent funds out of the artificial reef—the rigs to reef donation moneys to accomplish that purpose.

Mr. MANTON. Ms. Anderson, what is the optimum depth for your type of fishing vessel?

Ms. ANDERSON. We fish out to 40 fathoms. Past 40 fathoms we do not have much activity. That is our fathom of cable we can work with. Anything outside of 45 gives us no problems.

Mr. MANTON. Where are the shrimp? You are talking now to an amateur.

Ms. ANDERSON. They originate in shallow water, move out into the Gulf and disperse all through the Gulf. They are ranging out—you have different species. They frequent different fathoms. But normally the brown shrimp is the dominant crop. We will catch it out to 40 fathoms.

There are people who fish in the deep water for what they call the royal red. It is not a fishery really to speak of. But our brown will move out 40, 50 fathoms. We will fish from zero out to 50 fathoms.

Mr. MANTON. If there is a rig, let's say, in place under the water, how much below the surface has that got to be so you don't get entangled in it?

Ms. Anderson. We will become entangled in it. We are a bottom trawl.

Mr. Manton. So you cannot fish near or over a submerged rig then.

Ms. Anderson. No. We have to go around it.

Mr. Manton. So it is important that it be marked navigationally so that you know where they are, otherwise you are in trouble?

Ms. Anderson. When the platform is up, we will pick it up on the radar. If the platform is down, it has a reading. We will use our lorans and our plotters and we will be able to go around.

Mr. Manton. Is there any body of law which says who is responsible if you get ensnared?

Ms. Anderson. That is the question that is being asked now, is who has the responsibility. There is no contingency fund for any gear damage to the trawlers at this time once the rig is permitted to the State agencies or the reef committee.

Mr. Manton. There is no deep pocket then, there is nobody that is compelled to pay?

Ms. Anderson. No. We will bear the expense, and if we lose both sides of fishing gear, we are talking $20,000. If we bend an outrigger in the meantime on the hang trying to get loose, that is another $6,000. Some of the claims have ranged up to $30-, $35,000. Without the contingency fund and the storm-scattered material, we are hung up, then the trawler is going to bear the full expense before the contingency fund under the OCS was the mitigating factor.

Mr. Manton. I am a lawyer; I guess we always get nervous when there is no one you can sue.

Ms. Anderson. Well——

Mr. Manton. I guess the situation is they kind of tag you with contributory negligence or whatever if you get caught?

Ms. Anderson. Even insurance doesn't cover our fishing gear once it goes overboard. Once it is overboard it is not covered. That is why the oil industry developed the contingency fund. We have no recovery off of the insurance on fishing gear overboard. We just simply will be exposed to the full expense.

There is no place to go, because to fight it at the State level is where you are going to have to fight it, and they will just tie it up in court for years.

Mr. Manton. It looks like my time is up. I will turn the Chair over to Mr. Ortiz for some more questions.

Mr. Ortiz. You are just doing fine right there where you are.

I want to ask a question of Mr. Bartholomew. We have heard from the witnesses about the possibility of future assignments of leases to smaller operators. Does MMS have figures on the number of facilities that may be assigned to such operators in the future, and the Federal cost of cleaning up this site should site clearance fail to occur?

Mr. Bartholomew. Mr. Chairman, I certainly don't have hard projections. I can say with reasonable certainty, however, that it is a growth curve.

We can anticipate more and more assignments as time goes on, assuming that conditions that we see in the marketplace, the conditions that prevail in the Gulf of Mexico and indeed throughout the OCS, all of the ingredients are there to foster assignment of leases to smaller operators. Precise numbers are very difficult to come by.

Mr. ORTIZ. What happened just in case they fail, do they have some kind of performance bonds? How does it work?

Mr. BARTHOLOMEW. There is a long answer to that. The short answer is yes. We have a multi-pronged program that at its base requires minimum surety bonds. But I must note at the outset that the surety bond levels that we require are woefully short of what is needed.

The last time the bond levels were adjusted was back in the late 1960's. Today we require the operator of a lease to post a $50,000 surety bond for that lease or if the operator has several leases in the Gulf of Mexico, he can post an areawide bond of $300,000. Yet the cost for well abandonment and removal of platforms on a typical lease, say, in waters less than 200 feet, is somewhere between a million and a half and $3 million. So clearly the bond levels that we have now don't do it.

We published a notice of proposed rulemaking back in 1989, and that rule has been pending since that time. The effect of that proposed rule would be to increase the minimum bonding levels an order of magnitude. This would provide a better basis for protection to assure that those costs would be paid in many cases, certainly not in all.

We clearly need to go beyond even the higher bond levels that we have proposed. We are developing a phase two, if you will, to this program, in which we will provide a great deal more flexibility in how the funds can be generated, raised, and accounted for, to assure that the end-of-lease cost will be met. For example, in the case where a lease still has sufficient reserves in the ground, and with reasonable price and production projections to show that there will be sufficient revenue over the remaining life of the lease, the lessee could tap that revenue stream and set aside some of that money. We could be prepared to authorize escrow accounts.

We also anticipate that we can provide greater flexibility for third party guarantees, which could include the assignor, or a parent company, or maybe a corporate relative of the lessee, or some unique opportunities may also be available.

We had a workshop on this subject several months ago in New Orleans, and one of the largest marine construction firms in the world proposed a scheme wherein it would be prepared to guarantee the end-of-lease costs at the time that it signed a contract with an operator for abandonment and removal. As the representative of that company said, lease abandonment is a "growth industry" as far as we are concerned.

Mr. ORTIZ. You have not had experiences of operators who you assign them to do their job and they fail to perform at this time?

Mr. BARTHOLOMEW. Let me put it this way. The government has not yet had to pay the bill. It has been dicey a couple of times. We had a case in the last year or so in which a small operator did go bankrupt and was the holder of considerable interest, indeed operating interest, in several leases in the Gulf of Mexico. The potential liabilities for end-of-lease costs were on the order of $30 million.

We were successful in convincing earlier holders to the lease title, major oil companies who had done the earlier development, that they should pick up the bill for that. Which leads me to the last and possibly the most important element in this whole strategy: To assure that the government doesn't get stuck with the bill and that the bill does get paid.

It is the thinking of the agency that the holder of an OCS lease is liable for the end-of-lease cost associated with whatever that lessee either puts in the ground, that is, wells or structures on the site, for example, of platforms. We are saying that a lessee may assign not only his rights to that lease, but he can assign his liabilities, but not irreversibly. Thus, if some subsequent lessee defaults or is unable to meet those responsibilities, then we will be able to go back through the entire list of present and former lessees; to find one person in that chain who will pay the bill. This is totally consistent with practices in other industries as well.

Mr. ORTIZ. Just because they are small operators, you know, we don't want them to feel like we are putting a big burden on them to meet all these requirements. I know some of them are very responsible, and can do a good job, but at the same time we want to be sure they fulfill their obligations.

Now——

Mr. BARTHOLOMEW. The Chairman is absolutely correct in that, nor would I want to see—have anyone get the wrong impression, because there are many, very responsible small operators, many of whom are equal in competence to the best operators in the world.

Mr. ORTIZ. Just one question to Mr. Fortenberry. What is the industry's view for the need for increased bonding requirements? How do you feel about that?

Mr. FORTENBERRY. The industry commented on the MMS proposed bonds, and basically we agree with increasing the bonds that have been recommended by the MMS. It is a staged bonding that starts with initial lease, and as you go into your expiration and production, the bond gets greater, and I think the API and the OOC and the industry agrees with the same concern you raised, that there are some companies that may not be able to meet this, these bonds, the way it is set up now.

I think there are a couple of things that we would like—we have made recommendation to the MMS. For example, the size of the company that would be allowed to lease. We feel like the restrictions, you know, the net worth of the company is not necessarily the full criteria that you should use; and projected cash-flow, things like that ought to be considered.

So we basically agree with the things that were recommended, but there are some additional factors we think should be thrown in. We have re concern also, when we assign a lease to someone, we don't want that to come back on us, either, but I think if you get the right company and you get the bonding and everything set up up front, there should be no concern to the Federal Government. We are basically in agreement with the proposed recommendation.

Mr. ORTIZ. Thank you, Mr. Chairman. I know my time ran out.

Mr. MANTON. The Chair recognizes Mr. Green from Texas for questions.

Mr. GREEN. Thank you, Mr. Chairman.

Let me preface my remarks, coming from Houston and having served many years in the legislature, I know the benefits of the Artificial Reef Program that we have and also with the Shrimp Association. For many years they would come to Austin and explain to us, those of us who didn't necessarily have shrimpers in our districts, the problems they have, particularly with Texas law, and I appreciate the panel today.

Let me ask one question of frankly anyone, but mainly Mr. Osburn, Ms. Anderson or Ms. Berger. Are the States properly coordinating the site selection to minimize the impacts on the segments of the industry, whether it be sports fishermen or shrimpers, in coordination with the State? I know a little bit about at least what Texas does.

And then a corollary to that, does Texas work with Louisiana and Louisiana with Mississippi to also make sure that shrimpers and sports fishermen know the location of these artificial reefs?

Mr. OSBURN. Well, we provide—all of the States provide locations of new artificial reefs to the Coast Guard. And I believe they send it out on a notice to mariners broadcast, when they are new, and then of course we do have a Gulf States Marine Fisheries Commission, Artificial Reef Subcommittee that we deal among the State managers and look for common problems to share.

But I guess it is that Coast Guard notice to mariners that would be the mechanism for informing the shrimpers and other Gulf user groups about new artificial reefs in States that they weren't from.

Is that correct, Wilma?

Mr. GREEN. I guess in response, or to follow up on Mr. Osburn's testimony about being voted out on the committee, is that in site selection?

Ms. ANDERSON. Yes. We have constantly, Mr. Osburn, I, and Mr. Lusain, and the committee, argued over the siting. We have asked them not to take any more trawlable bottom. And the committee is made up—all we have is one shrimper that serves on the 10-member panel.

We sat down, we have had arguments after arguments, Mr. Green, over this thing for three years, and the industry sat down, pinpointed what would not hurt them, because even though Hal talked about you have got 1800 acres out there, we still have a lot of platforms out there taking up space at the present time, too, so we are concentrating in an area, that is what we are watching.

For us, if we have got to hang, or it is a mud bottom, or it is slab rock that we can't drag, we pinpoint. We said, you can put rigs here, it will not disrupt their fishing ground. The argument comes down, well, there is a hang over here. That is true, there may be a hang, but a rig is 300 and some odd feet tall, it is a hundred feet wide. You don't put it on a 10-foot hang; you increase the hang.

So the argument comes back to loss of trawlable bottom. I said, OK, if we are going to lose trawlable bottom, I want mitigation. It goes back and forth. The industry did tell them where they could put them. The committee doesn't agree with us. And so therefore we are outvoted constantly, and it does remain an argument of the State.

And on the mariner's report, I think Hal said it was 18 months before they go on the hang charts, so it is 18 months really once a rig goes down before the shrimper really knows where that hang of a new reef is at.

Ms. BERGER. From the national perspective, I feel I am fairly lucky in knowing what is going on around the country with artificial reef programs. As I said, 19 out of 23 coastal States have programs all of which are built around active public comment, and that includes the siting, the maintenance, and all other aspects of artificial reef management.

I want to make note to one thing that Wilma said, is that clearly there are other reasons and other criteria that go into siting artificial reefs, not just the preclusion of a commercial fishing activity. Wilma also mentioned placing reefs on mud bottoms, which for artificial reef purposes, are not always the best substrate to place an artificial reef on.

Besides that, there has been in Louisiana, and I can't speak for the shrimpers, but I have seen an outgrowth of strong popularity and support for the Louisiana Artificial Reef Program as well as that of Texas. The strength of support for Louisiana's program is that they looked at planning areas, and this allowed everyone from the onset of their development process to see what areas they were thinking about planning in, and then siting it that way rather than siting it site by site. That might be a solution to this problem, I am not sure.

In terms of communicating, ARDC has a data base of all the permitted artificial reef sites throughout the coastal United States. Last December, we released a map/brochure which designated, and showed the loran and latitude-longitude coordinates of every permitted artificial reef site, including those that are made out of obsolete petroleum platforms in the Gulf of Mexico. And we have received over 9,000 requests from people throughout the Gulf of Mexico for that.

So there are vehicles where the information is made available. However, there may need to be more work done on that from the commercial perspective..

Mr. GREEN. Is that in this publication?

Ms. BERGER. No, there was another publication that should have been with that.

Mr. GREEN. I saw the map.

Ms. BERGER. Right.

Mr. GREEN. Somebody could buy the information.

Ms. BERGER. No. That information was provided free because it was through a grant with National Fish and Wildlife Foundation. So that map is free information.

Mr. OSBURN. Mr. Green, if I could comment about the discussion on our advisory committee and working among the various user groups, I think in all fairness I should point out that there have been a number of votes consistent with the shrimper position on that advisory committee, and they involved basically rejection of sites. We have turned back, refused moneys from the oil company for materials they wanted to donate because we felt like it was not in the best interests of the user conflicts we were trying to solve.

A lot of material never even gets to the discussion stages with the advisory committee because as we follow the national plan and our own Texas plan, it tells us how to reject material that would create more hangs, unmarkable hangs in the Gulf. For instance, we don't accept car bodies, we don't accept small ships, we don't accept tires, we don't accept round culverts, things that in a storm would be dispersed.

We feel like this program is responsible for whatever it puts out there, and if it moves off-site, we will be responsible for putting it back on there.

Mr. GREEN. Thank you.

Thank you, Mr. Chairman.

Mr. MANTON. Mr. Coble from North Carolina.

Mr. COBLE. Thank you, Mr. Chairman.

Your last statement may have answered my question, but let me put it to you again. I have two questions, Mr. Chairman, that may well be overlapping, and I want to address it to all members of the panel.

Who assumes liability for the artificial reefs, A? And who monitors the reefs after their placement?

Mr. OSBURN. The permittee that holds the Corps of Engineers permit is liable, and in most cases it is a State agency. However, in Mississippi there is a private consortium which has taken over some artificial reef permits.

In Texas there were some private groups holding the permits. They have since transferred them to the State. But whoever has signed off on the bottom line on that Corps of Engineers permit—in most cases in Texas it is the Parks and Wildlife Department—we are liable for that material meeting the conditions of the permit, and the monitoring occurs through generally contracts with an offshore buoy maintenance service to go out there and check on the site, check on, you know, with fathometers, divers in some cases, to basically assure that the thing is marked if it is supposed to be and that it is still where it is supposed to be. And to date we have not had any major problems with that.

Mr. COBLE. If the monitoring were done by some third party, that would be in agreement, I presume, with the holder of the certificate?

Mr. OSBURN. Yes, it would be a contract that the Parks and Wildlife had with a private company to do that because we just may not have the kind of boats that it takes to get 100 miles offshore to look at the buoys.

Mr. COBLE. One more question, Mr. Chairman, if I may. I am interested in knowing what roles the EPA and the Coast Guard play in the Rigs to Reefs Program, if any. I imagine the Coast Guard would have a role.

Mr. OSBURN. I will be glad to take a stab at it. I have been living and breathing this program for four years, and the Environmental Protection Agency is required in the National Fishing and Enhancement Act to assure that any materials that the Corps is permitting to go out there has been freed of hydrocarbons. There is a hydrocarbon-free certificate that we require of our donors.

If you are taking a vessel out there, there is going to be an inspection, to be sure there are no PCBs in the paints or whatever. So they are involved in that particular phase. The Coast Guard is involved in telling the permittee what kind of navigational aids are going to be required on that particular site. So it will depend on the closeness to the shipping lanes or of the history of deep draft traffic in that area, whether they say you have got to have a lighted buoy, lighted with a horn, or you can't put anything here at all.

So we correspond with them during the Corps' permit process. Basically, the Corps sends out a 30-day public notice time period for anybody to comment about this new artificial reef. And that is when we get comments from MMS about whether they have got future lease ideas here. And we have rejected or shut down a site because of comments from these other agencies.

So it is working well. I believe the system is working.

Mr. COBLE. Thank you, sir.

Thank you, Mr. Chairman.

Mr. MANTON. I guess I'll go back for my next question to Mr. Osburn, who has been doing a fairly good job being a backup hitter here. It just came to mind, when you were talking about horns or lights: Has anybody placed some kind of device that emits a signal that could be picked up by navigational gear aboard the shrimpers or other vessels on any of these artificial reefs? It seems to me that would not be terribly expensive.

Mr. OSBURN. Are you talking about the buoy part, on the surface?

Mr. MANTON. On the surface or—I don't know, if they can transmit beneath the surface, but something to indicate that there is something here that could be a hazard to navigation.

Mr. OSBURN. I suspect technologically that is possible. I am not aware of any kind of device or what kind of expense, for example, a shrimp boat would have to invest to be able to pick up that signal.

You know, the shrimpers, they do have a tough time in the Gulf, and not because of artificial reefs, but because there is an estimated—off Texas, anyhow—up to 5,000 hangs of, you know, hard mud bottoms, or in a lot of cases, it is unmarked shrimp boats that have sunk out there, vessels that have sunk, that are just not marked. There is not a permit. Nobody has got liability for it. There is nobody marking it.

And the shrimpers, they learn by experience where they are, they share that experience. There is, you know, a group with the Texas A&M sea grant that works to help exchange information. They have got 5,000 hangs out there to dodge. They are generally pretty good at it.

We feel like the 20 sites that we have put out there that are very specifically marked with latitude and longitude are not an additional burden to the industry. But I am not aware of the particular signal device you are talking about.

Mr. MANTON. Maybe, Mr. Hall——

Mr. HALL. Mr. Chairman, I have with me Ron Schmied, a specialist in these matters, and he has some information regarding signaling devices, I believe.

Mr. SCHMIED. Yes, Mr. Chairman, if I may respond to your last question.

Mr. MANTON. Just state your name.

Mr. SCHMIED. My name is Ron Schmied, Special Assistant for Recreational Fisheries, Southeast Regional Office.

Many of the markers that are required are sometimes required by the Coast Guard, depending on the amount of clearance over the structure. Typically a rigid structure like an oil and gas platform, if there is less than 85 feet of clearance, they require a lighted horn buoy. Many of the other structures have radar reflectors on them so they can be picked up with radars. Not many of them have electronic signals emitted but typically use a radar reflector.

Mr. MANTON. I just thought as technology improves there might be something that would be cheap enough to affix to the known sites.

While you have the floor, Mr. Hall, I would just like to ask, on behalf of Mr. Ortiz, can fishermen still file claims for reimbursement from the Fishermen's Contingency Fund? If not, is there an alternative fund in place.

Mr. HALL. Of course, Mr. Chairman, but not for the platforms once they have been moved into an artificial reef area. In that case it belongs to the new permit holder and they would assume responsibility.

Mr. MANTON. So the rig has to be in the place that it was originally——

Mr. HALL. Right. That is still a very active program.

Mr. MANTON. The bonding that we talked about before, these are what, performance bonds?

Mr. BARTHOLOMEW. Surety bonds, yes.

Mr. MANTON. And I know some smaller contractors have problems because their balance sheet or their net worth or P&L is really not that terrific. What happens to these people? Are they shut out of the business if they can't come up with a bond, or is there some other way, an escrow account or some kind of fund for whatever are the end costs?

Mr. BARTHOLOMEW. Presently, if this hypothetical operator were unable to come up with the money for the surety bond, he would be foreclosed from operating in the OCS.

As I suggested earlier, shortly after we issue our notice of final rulemaking on the bonding rule that simply elevates the level of those bonds, we are going to be embarking upon a regulatory process, which will consider a wide variety of alternative strategies that can be used, including escrow accounts and so forth. It is our hope and expectation that this would provide a process that would be comparatively easy, or easier than the present system, which is very restrictive. Currently, you pretty much are stuck with surety bonds as the only alternative.

Mr. MANTON. Mr. Green, do you have any more questions?

Mr. GREEN. No other questions, Mr. Chairman. Thank you.

Mr. MANTON. Again, on behalf of Mr. Ortiz, have the States considered setting up a compensation fund for people like the shrimpers who find themselves aggrieved by the current situation? Anybody that wants to take a crack at it.

Mr. OSBURN. I will comment on that. In Texas in particular—I might mention that Louisiana, I believe, does have a contingency fund—in Texas, it is our consideration that we are liable for any material that moves off of a permitted site, and that if we did have material move off of our permitted site and we could document that the shrimper became entangled in it while it was off-site, lost gear, whatever, it is our consideration that our artificial reef fund would be available for compensation for that. And that is one of the advantages of having a Rigs to Reef Program, is that it eventually brings money in so that you can deal with these liability issues.

Mr. MANTON. How does that money come in? How is it funded?

Mr. OSBURN. It can come in through any kind of donation. It is a trust fund waiting for somebody to put money in. But basically all of it that has come in has been when an oil and gas company calculates the realized savings of toppling a rig versus the extra expense of taking it to shore and then they basically split that difference with us.

And we are getting donations of around $200,000 per rig. I know Louisiana, with the bulk of rigs offshore, has built up a fund over $4 million. In Texas ours is a little over $2 million. But because of the liability issues, we feel like we are responsible. I feel like there is somebody to sue if the material goes off-site, then we will be responsible as permittee for that material, and we will compensate anybody damaged when it is off-site. When it is on-site, it is the responsibility of the user groups to avail themselves of the information, and another thought came on your marking of this, the new technology that is available is the global positioning satellite systems, GPS, where you know within 15 feet of where you are.

And we are using that technology to provide the coordinates, and I think it is just a matter of time before those units are fairly cheap and basically every boat out there will have one.

And so you should know where you are, and in that case you are liable for your own action.

Mr. MANTON. Basically, as I mentioned before, you are saying if the rig is on-site, the material is on-site, it is too bad, simply contributor negligence by the one who is aggrieved, and if it is off-site, there is a compensation fund, however, the compensation fund seems to me to be sort of rig specific. There is no general funding of out-of-State revenues. Am I correct?

Mr. OSBURN. Well, it is designed—we would hope that the artificial reef fund would be able to be self-sufficient. We have spent oil and gas donation moneys for non-rig events. We have placed some other structures in the near-shore area for fishing and diving purposes, moneys contributed by oil and gas companies but spent not on rigs. So the money, once it gets into that fund, is available for anything from administration, salaries, buoys of non-rig sites, research, we are spending money on research, and compensation for liability.

Mr. MANTON. But there is not an insurance principle there. In other words, if in fact you had a rush of claims, that contingency fund could conceivably be exhausted, am I right?

Mr. OSBURN. I suppose you are right. You are getting a little bit out of my area, but I suspect the Texas Parks and Wildlife Department is the signee on these, our executive director. So it is not just—we would probably have to back up that rush on the fund with other funds. We may have to go to our legislature and ask. But that has not occurred.

Mr. MANTON. That is the answer I was looking for.

Ms. Anderson?

Ms. ANDERSON. Well, that is why I question—we have been asking about this contingency fund for some time. I am glad to hear it is coming about.

But I have to ask where the State agency's jurisdiction would end, because the bulk of these rigs are in Federal water, and it has always been an argument, who supersedes each other's jurisdiction? The State has a fund. Is it only going to cover State waters? What is going to happen in the Federal waters?

That is why we ask for the mandate to keep it into the Title IV and work it from that direction, because I don't think the State will pay any dollars for those in the Federal waters.

Mr. MANTON. I guess that is precisely why we are here, to take testimony as to the facts. States take title to abandon rigs as reefs. So I guess if you are the title holder of an instrument that causes damage, then you may very well be liable. I am learning here too today.

Ms. ANDERSON. In other words, those in Federal waters, they are going to have liability for.

Mr. MANTON. Counsel indicates that if States take title—Mr. Fortenberry?

Mr. FORTENBERRY. I would like to say something. I think most of the sites are in State waters, number one. There are some in Federal waters. But also when we put a platform in a reef site, we design the platform to stay there. We run a hurricane wave by to make sure it will not move.

So there should be very few things come out of the reef site once it is put there. We don't just dump stuff in there and it kind of rolls out of there. We go through, design it, make sure the steel is heavy enough to stay on the bottom, with expected sea conditions. So there should be very few things coming out of that reef site. I wanted to make that point.

Mr. MANTON. Then I think Ms. Berger wanted to make a comment. But go ahead.

Mr. SCHMIED. Yes, Mr. Chairman, again, one of the purposes of the National Fisheries Enhancement Act was to deal with the liability concern. And among other things, the new permitting procedures require that the permit applicant show that they have the fiscal ability to accept any liability that may arise regarding the reef development. And one of the reasons behind that was that prior to the national act, many of the reefs were being developed and built by nongovernmental entities who didn't necessarily have the ability to deal with liability concerns.

The net effect of the act has been to shift ownership of permits to in most cases the State or in some cases the counties or city, where the State or the county has gone and taken over ownership of the permits. And therefore if I guess some issue of negligence arises and it can be proven they were negligent, then I guess potentially the remedy of suit would be available, perhaps, pending any sovereign immunity concerns.

Mr. MANTON. Ms. Berger?

Ms. BERGER. I support Mr. Schmied's comments.

Mr. MANTON. I don't want to monopolize all the time. Perhaps the last round here——

Mr. GREEN. I have no other questions, Mr. Chairman. Thank you.

Mr. **Manton**. Well, thank you all for being here today.

I think that concludes our hearing. This committee will be adjourned.

[Whereupon, at 3:40 p.m., the subcommittees adjourned; and the following was submitted for the record:]

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June 24, 1993

BACKGROUND MEMORANDUM

TO: Members, Subcommittee on Oceanography, Gulf of Mexico, and the Outer Continental Shelf, and the Subcommittee on Fisheries Management

FROM: Subcommittee and Committee Staff

SUBJECT: Hearing on well and facility abandonment and site clearance for offshore oil and gas operations in the Gulf of Mexico; including the "Rigs-to-Reefs" program and other artificial reef initiatives.

On Tuesday, June 29th at 2:00 P.M. in 1334 Longworth House Office Building, the Subcommittee on Oceanography, Gulf of Mexico, and the Outer Continental Shelf, and the Subcommittee on Fisheries Management will meet to receive comments on well and facility abandonment and site clearance for offshore oil and gas operations in the Gulf of Mexico. In addition, information will be provided on the "Rigs to Reefs" program, how it works, who is involved, as well as the advantages and disadvantages of disposing of offshore oil and gas platforms in this manner.

Invited witnesses include: Mr. Henry Bartholomew of the Minerals Management Service, Mr. John Hall of the National Marine Fisheries Service, Mr. Sheldon Fortenberry of Chevron Petroleum Technology Company, Mr. Hal Osborn of the Texas Parks and Wildlife Department, Ms. Wilma Anderson of the Texas Shrimp Association, and Ms. Tina Berger of the Sports Fishing Institute.

BACKGROUND

WELL AND FACILITY ABANDONMENT

Site Clearance Procedures

In 1990, a committee composed of representatives of the oil and gas industry, the shrimping industry, the State of Louisiana, and the Minerals Management Service (MMS) was set up to address the problems associated with the removal of abandoned oil and gas structures in the Gulf of Mexico. In 1992, as a result of this cooperative effort, the MMS and the Gulf States reviewed and revised their site clearance procedures.

Under provisions of the Outer Continental Shelf Lands Act, oil and gas companies lease tracts of land on the OCS for exploration, development, and production. The new procedures are designed to ensure that any structure (i.e., wellheads, platforms, etc.) installed on an Outer Continental Shelf (OCS) leasehold is properly removed, and the site cleared so as not to conflict with other uses of the OCS. These procedures require companies to obtain approval of plans for all platform and rig removals and site clearances. In addition, the company must verify that the site has been adequately cleared by one or more of the following methods:

1) drag a trawl in two directions across the location;

2) scan across the location with a side-scan or on-bottom scanning sonar;

3) perform a diver search around the wellbore (often only approved in combination with 1 or 2 above); or

4) use other methods based on particular site conditions (only approved if the method is used with one of the above methods or if it can be proved that it meets or exceeds methods 1 or 2 above).

One of the most common structure removal techniques in the Gulf of Mexico involves the use of explosives to sever the bases of structures and well casings below the ocean floor. While the explosives used are usually the smallest needed to effectively sever the structures, it is possible that the explosions could harm or kill endangered sea turtles in the area.

To protect these creatures (sea turtles and endangered or threatened marine mammals that may incidentally be attracted to a removal operation to feed on fish stunned or killed by an explosion), the MMS and NMFS have developed procedures under section 7 of the Endangered Species Act and the Marine Mammals Protection Act. The MMS and NMFS are continuing to refine these procedures.

End-of-Lease Costs

Production from Outer Continental Shelf (OCS) oil and gas leases, developed by major oil companies and large independent producers, is reaching the stage that continued production of some of these leases (often called "sunset" leases) is economically unattractive. As an OCS facility reaches the point where it can no longer be operated by a large producer, the lessee may:

1) Continue to invest money in continued production that could be invested elsewhere at a more favorable return.

2) Abandon the lease by plugging and abandoning the wells, removing the platforms and other production facilities, and clearing the sea floor of obstructions as required. This could result in loss of otherwise recoverable reserves.

3) Assign (sell their interest in) the lease to a smaller producer who has lower overhead costs and less demanding economic expectations.

Major oil companies and large independent producers are assigning a substantial and increasing number of OCS oil and gas leases to smaller independent producers who may be financially unable to meet the "end-of-lease" costs for well plugging and abandonment, platform removal, and clearance of the sea floor.

Current estimates show that 224 of the more than 1,600 producing leases in the Gulf of Mexico are operated by smaller independent producers. The 224 leases contain 1,152 wells and 448 platforms. Some of these operators are so small that MMS requires them to post supplemental bonds to ensure that "end-of-lease" obligations will be met.

Based upon "end-of-lease" costs for a typical developed lease in less than 200 feet of water, the 224 leases operated by small independent producers could cost $590-880 million to remove. The bulk of the costs will become due by the year 2005 when the majority of the current platforms will have reached the end of their life expectancies.

The Minerals Management Service has recently published a Proposed Notice of Rulemaking increasing the bonding level for offshore oil and gas operations from $50,000 (not including additional security in the form of supplemental bonds which may be required by the Regional Director) to $500,000.

Fishermen's Contingency Fund

The OCS Lands Act states that operations on the OCS should be conducted in a manner to prevent obstruction to other uses of the waters or subsoil and seabed. Commercial fishing is a primary "other use" of the OCS in the Gulf of Mexico. Over the years, when fishermen have suffered damage to nets or equipment, as a result of obstructions related to OCS oil and gas operations, the commercial fishing industry and the oil and gas industry have resolved claims. However, when these problems are not settled by the oil and gas industry, claims are filed for damage compensation with the Fishermen's Contingency Fund, administered by the National Marine Fisheries Service (NMFS).

Title IV of the OCS Lands Act Amendments of 1978 established the Fishermen's Contingency Fund (Fund) to compensate commercial fisherman for property or economic loss caused by oil and gas obstructions on the OCS. The Fund is comprised of fees collected from offshore energy interests. NMFS regulations (50 CFR Part 296) explain in detail the procedures to be followed by the commercial fishing industry to determine if a claim is eligible for compensation.

RIGS-TO-REEFS PROGRAM (ARTIFICIAL REEFS)

While offshore oil and gas platforms in the Gulf of Mexico have occasionally effected fisheries resources, they have also provided an important man-made resource in the form of hard-bottom structures which serve as a base on which marine organisms can live. The recognition that these rigs, while in place, help to concentrate and facilitate the growth of commercial and recreational aquatic species, has prompted Federal, State, and private interests to consider expanded use of these rigs as artificial reefs.

Federal Role

The Secretary of Commerce issued the National Artificial Reef Plan in November 1985, in accordance with a mandate from the National Fishing Enhancement Act of 1984 (33 U.S.C. 2103). This plan sets out the national policy regarding artificial reefs, including obsolete oil and gas structures, and provides guidance to government and private concerns regarding the design, siting, permitting, construction, and management of artificial reefs. The plan specifically encourages the development of State and local artificial reef plans that incorporate specific criteria that account for local conditions.

The U.S. Army Corps of Engineers (COE) is the primary agency for granting permits to establish an artificial reef. Section 10 of the Rivers and Harbors Act of 1899, as amended by the OCS Lands Act of 1953, authorizes the Secretary of the Army to prevent obstructions to navigation in navigable waters of the United States, including artificial islands, installations, and other devices located on the seabed on the OCS. The regulations (33 CFR Part 320) explain in detail the procedures to follow when applying for a permit.

A State must file an application with the COE. The Corps then notifies other Federal and State agencies about the application. In addition to filing for a COE Artificial Reef permit, the State must acquire a permit authorizing the use of navigational aids from the U.S. Coast Guard. Depending on the location and depth of water, different types of buoys may be required.

Due to the long history of petroleum development in the Gulf, numerous structures are becoming obsolete. The number of oil and gas structures removed in the Gulf of Mexico reached an all-time high of 130 in 1990. This high level of removals continued into 1991 and 1992 with 99 and 119 structures removed, respectively. As of June 1993, over 100 applications for structure removal have been submitted. To put these numbers in perspective, an average of 35 structures per year were removed in the Gulf of Mexico from 1980-1987. The level of removals is expected to increase throughout the 1990's as oil and gas fields are depleted.

Currently, most of the structures are removed from the seabed and hauled ashore for salvage as scrap. In recent years, however, the value of these structures as artificial habitat for marine life has been widely recognized. In addition to their value as artificial reefs, they provide economic advantages to the oil and gas industry. Oil companies request bids for both salvaging and relocating the structures to an artificial reef site. According to industry, if it is less expensive to relocate the structure, the company donates the structure to the State. The company then also donates 50 percent of the savings to the State's artificial reef program.

State Initiatives

While materials used for artificial reefs may vary, a significant focus of many of the Gulf of Mexico coastal States' artificial reef plans involves the siting of oil and gas structures. Each of the coastal States in the Gulf of Mexico is active in developing local plans and in permitting and siting artificial reefs. To date, approximately 45 oil and gas structures have been donated to the coastal States for use as artificial reefs. The States of Texas and Louisiana are the most active of the coastal States, with 17 and 26 approved "rig-to-reefs" structures, respectively. The State of Texas has received over $2.5 million and the State of Louisiana over $4.2 million in donations to their artificial reef funds from the oil and gas industry. Two other oil and gas structures were donated to the States of Alabama and Florida.

The Louisiana Fishing Enhancement Act established the State Artificial Reef Program and required the development of a plan covering both State and Federal waters off the Louisiana coast. The plan, approved by the State legislature in June 1987 and since amended, has established 9 artificial reef planning areas in federal waters offshore Louisiana. Currently the State maintains 12 artificial reef sites utilizing the jackets of 26 former platforms. These sites are from 28 to 120 miles from shore in Federal waters. It is anticipated that an additional 5 sites utilizing 16 platforms will be established by the end of 1993.

The Texas Artificial Reef Act of 1989, directed the Texas Parks and Wildlife Department to promote, develop, maintain, monitor, and enhance the artificial reef potential in State and Federal waters adjacent to Texas. The Department was directed to develop a State artificial reef plan in a cost effective manner and minimize conflicts among competing user groups and environmental risks. In 1990, the Department adopted a fishery management plan for the development of an artificial reef program. Since 1990, this State program, with guidance of a 10-member Artificial Reef Advisory Committee, has developed several "rigs to reefs" sites in addition to enhancement of nearshore artificial reef sites. To date, the State has set up 20 artificial reef sites.

Benefits and Concerns

In addition to the financial benefits to the oil and gas industry and to the States, the "Rigs-to-Reefs" program also provides ecological and recreational benefits. Sports fisherman use these sites for rod and reel or speargun fishing. Other recreational uses include undersea photography and sport diving. These recreational benefits of the "Rigs-to-Reefs" program enhance coastal tourism and economic development for each of the coastal states involved.

The vast majority of the rigs used as artificial reefs come from Federal waters and are relocated to other areas within Federal waters. The shrimping industry is concerned that any further artificial reef development will lead to additional loss of trawlable bottom areas. In addition, moving oil and gas structures from deeper-water into shallow water areas may result in pieces of the structure being deposited as uncharted obstacles in the Gulf. This additional debris could increase the already large number of trawling obstructions within the Gulf.

In addition, concerns have been expressed that as these structures decay, they will become unstable and could be displaced during tropical storms or hurricanes, thus becoming uncharted hazards within the Gulf. Environmental groups are also concerned with the potential environmental degradation involved with decaying oil and gas structures, in particular, contamination from traces of oil that may be associated with these structures.

Issues

Members may wish to discuss the following issues at the hearing:

1) What is the status of the current rulemaking effort on bonding? Will this increased bonding level protect the Federal Government in the event that a number of the smaller operators go bankrupt?

2) Concerns have been expressed that the Fishermen's Compensation Fund is not paying legitimate claims and that the number of claims approved may have decreased. Why has this decline occurred? How much money is in the Fund? How much money has been disbursed?

3) Once an oil and gas structure is donated to the State for use as an artificial reef, who is liable for potential problems, i.e. fishing gear hung up, etc.? Can fisherman still file claims with NMFS for reimbursement from the Fishermen's Contingency Fund for the converted platforms?

4) Are the States and the commercial and recreational fishing industry properly coordinating site selection to minimize impacts on segments of the industry, such as shrimpers?

5) Are the Federal agencies, (i.e. NMFS, Coast Guard, COE) properly fulfilling their obligations and responsibilities in the "Rigs-to-Reefs" and other artificial reef programs?

6) Since the majority of the rigs-to reefs sites are in Federal waters, why has the Federal Government relinquished all revenue generated from the program to the States?

7) Advocates of "Rigs-to-Reefs" have presented a lot of information about the value of these structures in terms of improved productivity. What is the relative value of these artificial reefs to the overall production of the Gulf of Mexico fishery resources? Are there any trade-offs?

8) In terms of the environmental effects of converting oil and gas structures to artificial reefs, have there made any detailed environmental studies done to date? Are Environmental Impact Statements required by the National Environmental Policy Act (NEPA) for "Rigs-to-Reefs"?

9) Outside of the "Rigs-to-Reefs" program, what other initiatives are the Gulf States taking for artificial reef enhancement.

10) Are the State artificial reef programs adequate to regulate the reefs? Is there adequate state funding? Is there the possibility that there are too many artificial reefs? Do the States plan on accelerating their "Rigs-to-Reefs" programs as more structures become available?

QUESTIONS FOR HENRY BARTHOLOMEW

1) We have heard from several witnesses about the possibility of future assignment of leases to smaller operators, does MMS have figures on the number of facilities that may be assigned to such operators in the future, and the Federal costs of cleaning up these sites should site clearance fail to occur?

2) What is the status of the current rulemaking effort on bonding? Briefly describe the current proposed bonding rule.

3) Will this increased bonding level protect the Federal Government in the event that a number of the smaller operators go bankrupt?

4) In terms of the environmental effects of converting oil and gas structures to artificial reefs, have there been any detailed environmental studies done to date? Are Environmental Impact Statements required by the National Environmental Policy Act (NEPA) for "Rigs-to-Reefs"?

5) Has MMS been party to the investigation of the stranding of a large number of endangered sea turtles along the Louisiana coast this spring? Has MMS investigated whether this was in connection with ongoing demolition activities? Does MMS have estimates of the number of turtle mortalities that have occurred in the past in conjunction with site clearance activities, and if so how many?

6) What specific site clearance requirements are there for sites in greater than 300 feet of water?

7) To what degree is the high number of fish found in association with rigs due to aggregation rather than enhanced production? How does this effect Gulf fisheries?

8) Since the majority of the rigs-to reefs sites are in Federal waters, why has the Federal Government relinquished all revenue generated from the program to the States?

QUESTIONS FOR JOHN HALL

1) Once an oil and gas structure is donated to the State for use as an artificial reef, who is liable for potential problems, i.e. fishing gear hung up, etc.? Can fisherman still file claims with NMFS for reimbursement from the Fishermen's Contingency Fund for the converted platforms?

2) How much money is currently in the Fishermen's Contingency Fund?

3) How much money has been disbursed by the Fund (each year and total)?

4) We understand that there may have been a decline in the number of claims approved under the Fund, if so why? If not, why do some of the fishermen feel this way?

5) Since the majority of the rigs-to reefs sites are in Federal waters, why has the Federal Government relinquished all revenue generated from the program to the States?

6) Why has NMFS not taken a more active role in implementing the National Fishing Enhancement Act and the National Artificial Reef Plan? Are the Federal agencies, in general (i.e. NMFS, Coast Guard, COE) properly fulfilling their obligations and responsibilities in the "Rigs-to-Reefs" and other artificial reef programs? If so, how? If not, why?

7) Does NMFS feel that it is properly ensuring that the "Rigs-to-Reefs" program is receiving adequate public input and is being administered in a equitable and environmentally safe manner?

8) Is the "Rigs-to-Reefs" program in compliance with the National Fisheries Enhancement Act? Does the National Fisheries Enhancement Act mandate that the Fishing Management Council take part in the implementation of the "Rigs-to-Reefs" program? Should "Rigs-to-Reefs" be considered mitigation for bycatch? If so, why is this not being incorporated into the fisheries management plans?

9) In terms of the environmental effects of converting oil and gas structures to artificial reefs, have there been any detailed environmental studies done to date? Are Environmental Impact Statements required by the National Environmental Policy Act (NEPA) for "Rigs-to-Reefs"?

10) With regards to the recent mortality and stranding of endangered sea turtles along the Louisiana coast, has NMFS investigated these incidents and come to any determination of their cause? Does NMFS intend to take ant action against the shrimp industry lacking proof that the mortalities stemmed from trawling activity? Does NMFS feel that current site clearance procedures need to be re-examined to ensure that turtle mortalities do not occur?

11) To what degree is the high number of fish found in association with rigs due to aggregation rather than enhanced production? How does this effect Gulf fisheries?

12) In your testimony you state that 525 removals have been observed with no documented mortalities of sea turtles or dolphins. Yet, in a paper published by NMFS, strandings of 51 sea turtles (primarily Kemp's Ridleys) and 40 dolphins were attributed to oil platforms removal explosions. Is NMFS truly comfortable with the current level of protection provided through existing practices?

QUESTIONS FOR SHELDON FORTENBERRY

1) What is the Industry's views on the need for increased bonding requirements?

2) You mentioned in your testimony that these structures are sometimes reused. How often is this done? and why isn't this done more often?

3) Information has been provided about the current Federal role in the "Rigs-to-Reefs" program. Are the Federal agencies, (i.e. NMFS, Coast Guard, COE) properly fulfilling their obligations and responsibilities in the "Rigs-to-Reefs" and other artificial reef programs? If so, how? If not, why?

4) In terms of the environmental effects of converting oil and gas structures to artificial reefs, have there been any detailed environmental studies done to date? Are Environmental Impact Statements required by the National Environmental Policy Act (NEPA) for "Rigs-to-Reefs"?

5) To what degree is the high number of fish found in association with rigs due to aggregation rather than enhanced production? How does this effect Gulf fisheries?

QUESTIONS FOR HAL OSBURN

1) Once an oil and gas structure is donated to the State for use as an artificial reef, who is liable for potential problems, i.e. fishing gear hung up, etc.? Can fisherman still file claims with NMFS for reimbursement from the Fishermen's Contingency Fund for the converted platforms?

2) Are the States and the commercial and recreational fishing industry properly coordinating site selection to minimize impacts on segments of the industry, such as shrimpers?

3) Information has been provided about the current Federal role in the "Rigs-to-Reefs" program. Are the Federal agencies, (i.e. NMFS, Coast Guard, COE) properly fulfilling their obligations and responsibilities in the "Rigs-to-Reefs" and other artificial reef programs? If so, how? If not, why?

4) In terms of the environmental effects of converting oil and gas structures to artificial reefs, have there been any detailed environmental studies done to date? Are Environmental Impact Statements required by the National Environmental Policy Act (NEPA) for "Rigs-to-Reefs"?

5) Outside of the "Rigs-to-Reefs" program, what other initiatives are the Gulf States taking for artificial reef enhancement.

6) Are the State artificial reef programs adequate to regulate the reefs? Is there adequate state funding? Is there the possibility that there are too many artificial reefs? Do the States plan on accelerating their "Rigs-to-Reefs" programs as more structures become available?

7) You mention in your testimony that part of your monies received under "Rigs-to-Reefs" are used to cover possible liability costs. What are these liability costs? Are there current potential liabilities stemming from claims by the fishing industry, and is their a funding mechanism in place to address such claims?

8) Do you feel that there is a legitimate possibility that these "Rigs-to-Reefs" may be displaced, or broken up by weather, etc., in the future? What has the State done to address the possible navigation hazards and fishing obstructions that may result?

9) By bringing these rigs closer to shore, are their problems by further congesting an already crowded and heavily used nearshore area?

10) To what degree is the high number of fish found in association with rigs due to aggregation rather than enhanced production? How does this effect Gulf fisheries?

QUESTIONS FOR WILMA ANDERSON

1) Does the shrimping industry have any concerns over the potential increase in pipeline abandonment as stated in MMS testimony?

2) Does the shrimping industry have any concern with a recent MMS decision to allow the permanent abandonment of several wells in water depths greater than 1000 feet without having the site cleared down to the mudline?

3) To what degree is the high number of fish found in association with rigs due to aggregation rather than enhanced production? How does this effect Gulf fisheries?

QUESTIONS FOR TINA BERGER

1) Advocates of "Rigs-to-Reefs" have presented a lot of information about the value of these structures in terms of improved productivity. What is the relative value of these artificial reefs to the overall production of the Gulf of Mexico fishery resources? Are there any trade-offs?

2) In terms of the environmental effects of converting oil and gas structures to artificial reefs, have there been any detailed environmental studies done to date? Are Environmental Impact Statements required by the National Environmental Policy Act (NEPA) for "Rigs-to-Reefs"?

3) To what degree is the high number of fish found in association with rigs due to aggregation rather than enhanced production? How does this effect Gulf fisheries?

Testimony of
Henry G. Bartholomew
Deputy Associate Director, Operations and Safety Management
Minerals Management Service
Department of the Interior

Before the Merchant Marine and Fisheries Committee
Subcommittee on Oceanography, Gulf of Mexico,
and Outer Continental Shelf
and Subcommittee on Fisheries Management
U.S. House of Representatives
June 29, 1993

Mr. Chairman and members of the subcommittees, I am pleased to have this opportunity to testify before you on the abandonment of oil and gas wells and facilities in the Outer Continental Shelf (OCS). The Minerals Management Service (MMS) requirements for lease abandonment are designed to ensure safety, protection of the environment, conservation of resources, and to facilitate other uses of the Outer Continental Shelf. Generally, we believe these requirements have been effective in carrying out the above purposes. However, we welcome the opportunity to work with the Subcommittees on any necessary improvements identified as an outgrowth of this hearing.

I will also speak about the "Rigs to Reefs" program in which MMS participates. Under Rigs to Reefs, obsolete oil and gas rigs may continue to serve usefully as artificial reefs, providing an ideal habitat for marine life and enhancing the environment for commercial and recreational fishing.

As background to this testimony, I would like to provide some information on the role and mission of MMS. The Service is the primary Federal agency responsible for ensuring that all aspects of oil, gas, and other mineral leasing, exploration, development, production and abandonment activities on the OCS are conducted in a safe and clean manner.

Since 1954 when the program began, the OCS has produced approximately 9.2 billion barrels of oil, over 100 trillion cubic feet of natural gas and generated over $100 billion for the Federal Treasury. The OCS produces approximately 1/4th of our Nation's gas and 1/8th of its domestic oil.

In fulfilling its mission, MMS has established regulations for all activities on offshore leases. These include requirements to safely clear lease sites after operations have terminated.

Lessees must properly plug wells to prevent fluid leakage. Wellheads, casings, pilings, and other structures must be removed to prevent them from becoming navigational hazards or impeding other uses of the OCS. When pipelines are abandoned, MMS rules ensure that the lessee abandons the line in a manner that will prevent hydrocarbon seepage and minimize conflicts with other OCS uses.

Well Abandonment

Well abandonment is the first step in the lease clearance process. The MMS ensures that lessees properly abandon exploration and development wells using the best available technology. Comprehensive regulations on well abandonments are found in Subpart G of Title 30.

Proper well abandonment requires the isolation of subsurface hydrocarbon zones from other zones, from the surface, and from freshwater aquifers. This is accomplished by setting a series of cement and mechanical plugs. The plugs must be tested to determine their pressure integrity and durability.

The lessee must also clear the well site by removing the wellhead and other obstructions to at least 15 feet below the mud line. After the well is abandoned, the lessees must supply verification that the well site has been cleared.

The MMS also allows wells to be temporarily abandoned, but only in a way that minimizes conflict with other uses of the OCS. A well may be temporarily abandoned only if there are firm plans for re-entry or permanent abandonment. Moreover, temporarily abandoned wells must protect obstructions such as subsea wellheads and casing stubs so that commercial fishing gear will not be damaged. These obstructions must also be marked according to U.S. Coast Guard requirements.

Before plugging a well, the lessee must obtain MMS approval. The request lists the reason for abandonment and a description of the proposed process. This process must include the planned locations of the plugs, casings, cutting depths, and site clearance method. MMS engineers analyze the request to verify if the procedure is safe and effective. The engineers may require modifications to the procedure by adding stipulations to the approval letter.

After the plugging procedure commences, MMS conducts spot checks to verify that the abandonment is conducted according to the approved procedure. Historically, MMS inspectors have found very few incidents of noncompliance while witnessing abandonments.

Following well abandonment, the lessee must submit a report to MMS with the details concerning the abandonment procedure. This includes the verification that the site is clear. The MMS retains these records to track OCS abandonments.

Platform Removal

Platform removals are regulated by MMS according to 30 CFR part 250, subpart I. As with abandoned wells, all platforms (including casing, wellhead equipment, templates, and pilings) must be removed to a depth of at least 15 feet below the ocean floor.

The lessee's request to remove a platform must list the details concerning the proposed method of removing the platform, either through the use of explosives or mechanical severing. If endangered species could be affected by the removal, the lessee is given detailed instructions concerning measures necessary to protect the species.

When the platform is removed, MMS and the National Marine Fisheries Service (NMFS) may send witnesses to observe the removal, depending on the method employed for removal. All removals using explosives are observed. The platform may be towed to shore to be sold for scrap metal, recycled, or to become part of the Rigs to Reefs program.

Finally, the lessee must verify that the location is clear of all obstructions. The results of the verification must be submitted to MMS by letter from the company performing the work which certifies that the area was cleared of all obstructions, the date of the work, the extent of the area surveyed, and the survey method.

Pipeline Abandonment

The MMS also ensures that operators abandon pipelines to prevent seepage of hydrocarbons into the environment and prevent accidental encounters with vessels.

The lessee must submit a request to abandon a pipeline segment. A pipeline may be removed or abandoned in place. In cases where removing the line may adversely affect the surrounding environment, the pipeline may be abandoned in place. However, MMS regulations in 30 CFR part 250, Subpart J require that the pipeline does not constitute a hazard to navigation, commercial fishing operations, or other OCS uses. Measures are taken to permanently seal and protect the pipe. The line is flushed to purge hydrocarbons, filled with seawater, cut, and plugged with the ends buried at least 3 feet. Moreover, pipe stems and valves cannot be exposed.

The MMS evaluates pipeline abandonment requests to determine if the best approach is taken to minimize the risk of mariners accidently encountering abandoned pipelines. Vessel collisions with abandoned pipelines are extremely rare in the OCS.

Historically, these accidents have usually occurred in shallow water close to the shore.

The MMS maintains an extensive database of OCS pipeline locations. Almost 60% of the larger diameter transmission lines that bring oil and gas ashore to Louisiana originate in the OCS. Over 1,300 segments of OCS pipeline have been abandoned with no indication of environmental problems. The MMS continues, however, to review the integrity of older pipeline abandonments and evaluate current procedures. Considering the anticipated increase in the number of pipeline abandonments, MMS is preparing for an increased review and verification workload.

Site Clearance and Verification of Abandoned Structures in the Gulf of Mexico

In a cooperative effort to improve the process and requirements for removing abandoned oil and gas structures in the Gulf of Mexico, MMS formed a committee in 1990 to study the issues and recommend revisions to our regulatory requirements. This committee included representatives of the oil and gas industry, shrimping industry, State of Louisiana, Jefferson Parish, and MMS. The committee's recommendations were considered in formulating a new Notice to Lessees and Operators (NTL No.92-02), which was issued in May of 1992 and supersedes previous NTL's Nos. 90-01 and 90-02. The NTL requires the following site clearance practices for sites in less than 300 feet of water:

a. Exploratory wells - a 300-foot radius circle is to be cleared. With few exceptions, trawling is not required. Sonar scanning of the area is sufficient to determine the presence or absence of debris. In most cases, only casing stubs need to be removed.

b. Platforms - a 1,320-foot circle must be cleared; site clearance verification requires trawling.

c. Single well caissons and well protectors - a 600-foot circle to be cleared; verification requires trawling.

The lessee submits a site clearance plan to MMS Regional Supervisor, Field Operations, for approval with the permit application for platform or structure removal. The site clearance verification must be completed 60 days after structure removal. In the interim the location is marked as a navigation hazard in accordance with U.S. Coast Guard regulations. Verification of site clearance may be accomplished by one of the following methods:

1. Dragging a trawl in two directions (i.e., North-South and East-West) across the location.
2. Performing a diver search.
3. Scanning with a side-scan or on-bottom scanning sonar.

However, if the site warrants, other methods can be used. In shallow water, trawling is the most common means of verification. Commercial shrimpers typically perform the trawling using their nets to sweep the area around a removed structure. They may also recover remnant debris from the site. Certification that the area has been cleared of all obstructions and other details of the work are required to be submitted to MMS.

When trawling is employed, the following requirements pertain:

- Trawling contractors must be licensed.
- The trawling vessel must be capable of producing paper or hard copy plots of specific lines to show that the vessel has satisfactorily covered the area.
- Trawling nets must be representative of accepted shrimping industry standards.
- All oil and gas related objects must be recovered and reported to MMS.
- The trawling contractor must submit a verification letter to MMS .

The MMS requests the operator or trawling contractor to contact MMS "Fisherman's Contingency Fund Hangs Data Base" to see if any recorded obstructions are located within the area to be trawled. More than 700 structures have been removed from the Gulf of Mexico OCS to date.

Shrimping\Fishing Industry Claims

Many problems encountered by fishermen have been mutually resolved between the shrimping and fishing industries and the oil and gas industry. Some claims are filed for compensation of damage from the Fisherman's Contingency Fund. When claims are filed, MMS provides the National Oceanic and Atmospheric Administration (NOAA) with information regarding the exact locations of oil and gas operations. NOAA then provides disbursements from the fund for approved claims.

Site Clearance in Deepwater

The Gulf of Mexico Region recently approved a request to permanently abandon several wells with the wellhead and casing in place above the mud line. The wells were located on expired leases in water depths greater than 1,000 feet. The Regional Supervisor granted this approval under § 250.112(i) after determining that the wellhead did not constitute a hazard to other users of the seafloor.

The subject wells were tested and deemed producible, but were not commercial due to limited mineral resources, lack of transportation and other support facilities, or low oil and gas prices. The approval to leave the wellheads and casing in place saved the lessee the cost of mobilizing a drilling vessel to remove the stub below the mud line. Leaving the casing stubs above the mud line also enables future lessees to access the wells.

Protecting Marine Life

A common structure removal technique involves the use of explosives to sever the bases of structures and well casings below the mud line. The explosive charges used are usually the smallest needed to effectively sever the structures. Still, it is possible that explosions may harm endangered marine turtles in the vicinity. To reduce or eliminate the likelihood of such effects, MMS and NMFS have developed administrative and operational procedures, largely through formal consultations under Section 7 of the Endangered Species Act.

These procedures maximize protection of marine turtles, as well as non-endangered dolphins, that may be attracted to a removal operation. When the explosive charges used are greater than 50 pounds, MMS and NMFS personnel work in consultation and at least two NMFS observers are sent to observe the structure removal. These observers monitor the removal and ensure that animals are not in the vicinity where they might be killed or injured when charges are detonated. The MMS may also send additional observers. To date, over 700 structures have been removed, and no associated turtle mortalities have been observed since 1987 when special conditions and requirements for platform removal were imposed. Prior to that date, only 2 turtle mortalities have been documented.

Rigs to Reefs

A relatively new development in the disposal of obsolete OCS oil and gas structures has been the selection of certain platforms and jackets to be used as artificial reefs under the national program established by the National Fishing Enhancement Act of 1984.

As the numbers of platforms and wells in coastal waters increased over time, the benefits of these structures for commercial and recreational fishing became readily apparent. Artificial reef development had started in the Gulf of Mexico in the mid-forties. During the 1960's and 70's, obsolete Liberty ships were transferred to Gulf Coast States to be sunk for use as reefs to enhance fishing. In the 1950's and 60's fisherman quickly recognized that oil and gas production platforms were functioning as de facto artificial reefs and were great places to catch fish. During the 1970's scientific research on this phenomenon began and in the early 1980's studies confirmed the beneficial impact of the oil and gas structures on the marine environment. The MMS cooperated with and facilitated many of these studies. For example, in 1985, MMS entered an agreement with the National

Marine Fisheries Service to collect data on recreational fishing associated with petroleum structures as part of the Atlantic and Gulf Coast Marine Recreational Fishery Statistics Survey.

Artificial habitats, whether intentionally placed artificial reefs or working petroleum platforms, were found to increase local algal and invertebrate biomass and significantly increase numbers of fish and varieties of species. In high profile habitats, such as petroleum platforms, fish can be found in concentrations 20 to 50 times greater than in nearby soft-bottom areas.

A single 200 foot platform jacket - the submerged portion of the structure - provides several acres of hard substrate that fosters the growth of algae, barnacles, mussels, anemones, sponges and other attached organisms. These organisms form the base for a highly complex food chain. The structures create hiding places for small fish and invertebrates, and provide excellent breeding grounds.

Recognizing these benefits, in January 1983, MMS announced its support for the concept of converting selected obsolete oil and gas structures to artificial reefs in appropriate locations. This was an initial step towards what has become known as the Rigs to Reefs program. Subsequently, the Department of the Interior (DOI) formed the Recreational and Environmental Enhancement for Fishing in the Seas Task Force composed of representatives from the Federal, State, and private sectors to promote an artificial reef program on the national level. The National Fishing Enhancement Act of 1984, (P.L. 98-623, Title II) established artificial reef development standards and tasked the Department of Commerce (DOC) with developing a national artificial reef plan. This plan, produced by the National Marine Fisheries Service of the DOC, recognizes oil and gas structures as potentially suitable materials for artificial reef development.

The 1984 legislation assigns the federal regulatory responsibility for artificial reefs to the Department of Army Corps of Engineers (Corps), and encourages the states to develop plans for artificial reefs in state and federal waters. The Corps is responsible for issuing permits for these reefs. The MMS role is one of cooperation with and support of coastal states and the

Corps of Engineers in artificial reef development activities. The MMS may serve in an advisory position to the Corps when called on to do so.

The usual procedure for converting oil and gas platforms to artificial reefs involves the donation of the structure by the producer to a state which takes title to it. Most coastal States assume responsibility for the reefs in both federal and state waters. The structure is then placed in a location which

is permitted as an artificial reef site. Approximately 40 abandoned oil and gas platform have been converted to artificial reef use in the Gulf of Mexico.

Occasionally, oil and gas structures may be toppled in place and used as reefs at their original location. In these instances, MMS requires that wells be abandoned in conformance with all existing requirements, i.e. cleared to 15 feet below the mud line. The deck of the platform is removed to shore and only the jacket portion of the structure is toppled. This method retains the possibility that the structure could be removed at a later date if necessary and the seabed cleared in the manner prescribed by the regulations.

State governments have the major role in planning and developing artificial reefs. The MMS cooperates with them by keeping apprised of current activities and serving as an informal source of information for oil and gas companies about the possibilities of donating platforms when leases are terminated.

In closing I would note that with the advent of large numbers of independent companies and the increase in well abandonments and consequential structure removal, there is a substantial increase in MMS's workload and responsibilities. Further challenges will emerge as industrial activity moves to deeper frontier waters and exploration is undertaken at much greater depths. The MMS will continue in its efforts to maintain safe and environmentally clean operations in the OCS.

This concludes my prepared remarks. However, I would be pleased to respond to questions from the Subcommittee.

TESTIMONY
OF
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CHIEF, HABITAT POLICY AND MANAGEMENT DIVISION
NATIONAL MARINE FISHERIES SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

BEFORE THE

SUBCOMMITTEE ON OCEANOGRAPHY, GULF OF MEXICO, AND THE OUTER CONTINENTAL SHELF
AND THE
SUBCOMMITTEE ON FISHERIES MANAGEMENT
MERCHANT MARINE AND FISHERIES COMMITTEE
U.S. HOUSE OF REPRESENTATIVES

JUNE 29, 1993

Messrs. Chairmen and Members of the Subcommittees: My name is John R. Hall. I am the Chief of the Habitat Policy and Management Division, National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration, U.S. Department of Commerce. I appreciate the opportunity to testify on our agency's role in Gulf of Mexico oil well and facility abandonment and site clearance procedures, and the "Rigs-to-Reefs" program. NMFS is involved in several of these activities.

"Rigs-to-Reefs" Program

The "Rigs-to-Reefs" program was initiated in the early 1980's to explore options for reusing obsolete offshore oil and gas structures in the construction of artificial reefs. Most of these discussions focused on the Gulf of Mexico area, where roughly 95 percent of the offshore structures were located. From the outset, NMFS has been involved in discussions and has attempted to build consensus on the appropriate use of obsolete oil and gas structures in artificial reef and related marine recreational fisheries programs.

Efforts to develop a "Rigs-to-Reefs" program in the early 1980's were precipitated by at least three major factors. First, there was increased recognition that about 4,000 offshore structures in the Gulf of Mexico constituted perhaps the largest de facto artificial reef system in the world and as such, greatly enhanced reef fish habitat in the Gulf of Mexico. A typical structure in 150 feet of water is estimated to provide up to two acres of hard underwater substrate. Hard substrate is a prerequisite for the establishment of hard and soft corals, barnacles, mussels, bryozoans and other encrusting organisms commonly comprising reef or "hard bottom" communities. In addition to increasing the supply of food, these reef habitats provide orientation, shelter, spawning, nursery, and feeding areas for many recreationally and commercially valuable reef fish species like snappers and groupers.

Second, research was confirming the long-held belief that offshore structures played a vital role in recreational and commercial fisheries in the Gulf. Many researchers and others believed that the construction of offshore oil and gas structures was a key factor in the dramatic growth of marine recreational fisheries in Gulf waters, especially in areas offshore of Louisiana and Texas. Information gathered by NMFS through its Marine Recreational Fisheries Statistics Survey in the early 1980's confirmed this belief. Survey data showed that in 1984, offshore structures were the destinations for over 37 percent of all saltwater sportfishing trips made by coastal Louisiana residents. Further, when Louisiana coastal residents traveled more than three miles from shore to fish, over 70 percent of their trips were made to oil and gas structures. Texas results were similar -- over 28 percent of all sport fishing trips were to offshore structure locations. Notably, catch information showed that compared to non-structure trips, anglers kept from two to six times more of the fish they caught around structures. This suggested their catches included more desirable and "keeper-sized" fish.

The third motivating factor involved growing concern over the large numbers of structures projected for removal and the likely effect of such removals on marine fisheries. International and U.S. law and offshore lease agreements require the complete removal of offshore structures at the end of the intended useful life. In 1984, the Marine Board of the National Research Council projected that by the year 2000, two-thirds of the existing offshore structures will have become commercially unproductive and subject to removal and onshore disposal. Over 90 percent of the 1,650 structures likely to be removed from

Louisiana offshore waters would be from waters less than 100 feet deep. This fact raised great concern regarding the resulting loss of habitat and fishing opportunities from this prime nearshore fishing and diving area.

Faced with growing interest and concern regarding the future of offshore structures in the Gulf, the U.S. Minerals Management Service (MMS) convened several task forces and conferences to identify and discuss the issues that might constrain the reuse of offshore structures. A number of issues and concerns shared by NOAA and other parties surfaced from these discussions.

- There was an absence of national policy regarding artificial reef development, in general, and "Rigs-to-Reefs", in particular.
- There was public concern that a "Rigs-to-Reefs" program would allow oil and gas companies to sidestep structure removal requirements, thereby creating a huge offshore dumping ground.
- It was unclear whether current law would allow on-site conversion to artificial reef use or if complete physical removal of the structure would still be required.
- Oil and gas interests were concerned that the "Rigs-to-Reefs" process would still leave them with an unacceptable liability exposure and that without additional financial incentives, the conversion process may prove more costly

than standard removal options.

- The military community was concerned about national defense implications and underwater navigational safety.
- The shipping and commercial trawling industries were concerned about navigational safety and fishing gear damage.
- There was confusion regarding state and federal reef permitting and marking requirements.
- Recreational and commercial fishing interests were concerned that no formal siting process existed to ensure that reefs would be constructed in areas and depths conducive to their use.

In 1983, the Secretary of the Interior and the President of the National Ocean Industries Association formed a task force (the Department of Commerce, through NMFS, was a significant participant in this effort) to encourage the creation of a national artificial reef policy, plan, and program for the United States. This objective was appreciably advanced in November 1984 with the passage of the National Fishing Enhancement Act (NFEA) of 1984 (Title II, P.L. 98-623). Through the Act, Congress recognized the many biological, social, and economic benefits generated by artificial reef development, established national standards for artificial reef construction, mandated the Secretary of Commerce (Secretary) to develop a National Artificial Reef Plan, and established an artificial reef permit program under the U.S. Army Corps of Engineers.

In many substantial ways, NFEA addressed key constraints in the "Rigs-to-Reefs" program. Let me briefly outline these advances since they shed light on how the Program currently operates.

1. NFEA filled the policy void by establishing a national program "to promote and facilitate responsible and effective efforts to establish artificial reefs." It also established national artificial reef construction standards.
2. Through its mandates, NFEA resulted in the development of a National Artificial Reef Plan by the Secretary. Discussed in more detail in the next section, the Plan has stimulated and provided technical guidance to States, counties and others to develop more detailed and site specific artificial reef plans for their areas. Currently, plans have been drafted or adopted by every Gulf and many Atlantic coastal states. There now exists a much more reasoned and responsible approach to reef development in these areas that is more responsive to the needs and concerns of artificial reef users and other public and private interests.
3. NFEA also reduced the liability exposure for donators of reef construction material and permit holders, providing specific conditions are met.

Perhaps providing an example of a "Rigs-to-Reefs" conversion would clarify how the process has evolved and improved as a result of the NFEA and state initiatives. Louisiana's artificial reef program was formally established by the Louisiana Fishing Enhancement Act (LFEA) of 1986. Modeled after NFEA, the LFEA also mandated the development of a state reef plan which adopts most of the planning, siting, construction, management, and monitoring criteria set forth in the National Plan. Eight artificial reef planning areas were established and permitted along the Louisiana coast. The Louisiana Artificial Reef Council, established by the LFEA, evaluates requests and proposals for "Rigs-to-Reefs" conversions. Once the details are worked out, the donor company complies with all removal requirements at the original site, transports the structure to the approved state site, and deploys it consistent with the state requirements. At this point in the process, title to the structure transfers to the State. If the donor realizes a cost savings from this method of disposal, a specified portion of the savings is contributed to a state trust fund for operation of the Louisiana program. As long as all permit requirements are met, the donor company is absolved of future liability claims.

Clearly, this process provides a well-reasoned, predetermined re-deployment strategy for obsolete oil and gas structures that addresses nearly all concerns raised during the early stages of the "Rigs-to-Reefs" program.

National Artificial Reef Plan

The National Artificial Reef Plan (Plan) was a requirement of NFEA of 1984. The Secretary was charged with preparing the Plan, which was subsequently completed and published in 1985.

The Plan was formulated in consultation with Federal agencies involved in reviewing and approving Federal permits for artificial reef construction (NMFS, U.S. Fish and Wildlife Service, Environmental Protection Agency, MMS, U.S. Coast Guard, and the Corps of Engineers). Substantial assistance was received from the States, local governments, Regional Fishery Management Councils and Marine Fisheries Commissions, industry, artificial reef authorities, and the public. The Plan will be revised as new information becomes available.

The Plan serves three major functions. First, based on the best available scientific information, it provides guidance to individuals, organizations and government agencies on technical aspects of artificial reef planning, design, siting, construction, and management for effective artificial reef development. Second, the Plan is a guide and technical reference for Federal and State agencies involved in artificial reef permitting and management. The Plan helps to ensure that siting, construction, monitoring and management of artificial reefs permitted under applicable Federal laws (section 10, Rivers and Harbors Act of 1899; section 404, Clean Water Act; section 4(e), Outer Continental Shelf Lands Act) is conducted in a manner consistent with standards set forth in NFEA. The Secretary of the Army must consider the Plan when issuing an artificial reef permit and notify the Secretary of Commerce of any need to depart from the Plan. Third, the Plan encourages and provides guidance for developing detailed, site-specific regional, State, and local artificial reef plans that focus on specific criteria for local conditions.

The Plan briefly addresses environmental mitigation and modified tax obligations as possible incentives to facilitate the donation and transfer of materials of opportunity for artificial reef construction. Alternatives for the transfer of construction materials also are mentioned.

Protected Species Considerations

There is the potential for loggerhead, Kemp's ridley, green, hawksbill, and leatherback sea turtles, which are listed under the Endangered Species Act (ESA), and for certain marine mammals to be adversely effected as a result of the explosive removal of structures associated with offshore oil and gas operations.

Both the Corps of Engineers (state waters) and MMS (federal waters) consult with NMFS under section 7 of the ESA on proposed removals. NMFS acknowledges that an incidental take of sea turtles may occur and issues an Incidental Take Statement, with the Biological Opinion, containing terms and conditions by which the take can be mitigated. These conditions include:

- The use of qualified observers, as approved by NMFS, to monitor the area around the site before, during, and after detonation of the charges. Surface observation must be conducted for as long a time as possible before removal of platforms; forty-eight hours is recommended.
- On the day of blast, a 30-minute aerial survey must be conducted within one hour before and one hour after detonation. These surveys should encompass all waters within 1,000 yards of the structures.
- If any sea turtles are observed within 1,000 yards of the platform (blasting site) prior to detonating the charges, the blasting will be delayed until attempts are successful in removing them at least 1,000 yards from the blasting site. The aerial survey must be repeated prior to resuming detonation of charges. (The duration of the survey and the area covered will vary depending the amount of explosives used. The time and distance cited above are for fifty pounds or less of explosives.)

- Detonation of explosives will occur no sooner than one hour following sunrise and no later than one hour before sunset. (These criteria eliminate the glare associated with sunrise and sunset.) However, if it is determined by on-site representatives (NMFS and the permitting agency) that special circumstances, e.g., impending dramatic change in weather conditions, justify modifying the time restrictions, and modification is not likely to have an adverse effect on listed species, the blast may be allowed to proceed.
- During all diving operations (working dives as required in the course of removals), divers will be instructed to scan the subsurface areas surrounding the platform (blasting) sites for turtles and marine mammals. Any sightings must be reported to the NMFS on-site representative. Upon completion of blasting, divers must report and attempt to recover any sighted, injured, or dead sea turtles or marine mammals.
- A report summarizing the results of the removals and mitigation measures must be submitted to the permitting agency and NMFS within fifteen working days of the removal.
- Charges must be staggered 0.9 seconds for each group of structures to minimize the cumulative effects of the blasts. If a removal operation involves multiple groupings of structures, the interval between detonation of charges for each group should be minimized to avoid the "chumming

effect." Whenever such intervals exceed 90-minutes, the aerial survey must be repeated.

The American Petroleum Institute, representing operators who remove oil and gas drilling and production structures and related facilities, has petitioned NMFS to promulgate regulations under section 101(a)(5) of the Marine Mammal Protection Act for the incidental take of bottlenose and spotted dolphins in state waters and on the Outer Continental Shelf in the Gulf of Mexico as a result of explosive removals. The safeguards, monitoring, and reporting requirements provided in the request are consistent with the above detailed conditions. A proposed rule for the incidental take of bottlenose and spotted dolphins was published June 17, 1993 (58 FR 33425).

To date over 525 removals have been observed and there have been no documented mortalities of sea turtles or injury or mortalities of marine mammals. One sea turtle was found with a split carapace. It was captured, rehabilitated, and released. Five sea turtles had to be removed from operational areas before blasting could proceed.

MMS has expressed interest in reinitiating section 7 consultation based on the observer information collected for removals. NMFS has not yet received a formal request to reinitiate consultation.

Fishermen's Contingency Fund (FCF)

The FCF (authorized by Title IV of the Outer Continental Shelf Lands Act Amendments of 1978) mitigates conflicts between the fishing and offshore energy industries by compensating fishermen for casualties caused by OCS energy-related debris. The FCF Program compensates eligible casualties for 100 percent of gear replacement or repair cost, vessel replacement or repair cost not to exceed a reasonable insurance deductible (whether or not insurance was in force), and 50 percent of the gross economic loss from the time of the casualty through the date the gear or vessel could reasonably have been repaired or replaced. Most claims involve damage to mobile fishing gear, typically shrimp nets, and towing over bottom obstructions related to oil and gas activities. Fishermen are afforded a presumption that their casualties are caused by oil and gas-related obstructions if they make a report of their casualty to the program within fifteen days after returning to port. Otherwise they have to prove that the obstruction was related to oil and gas activities.

The Program is totally self-supporting through an assessment imposed on energy companies. The Fund's authorizing legislation provides a ceiling of $2 million on amounts of deposit. NMFS' policy is to request an assessment whenever Fund balances fall below an average year's claim disbursements.

The FCF Program began in September 1978. Since that date, 1,287 claims have paid approximately $6.7 million. Ninety-five percent of the claims are from the Gulf of Mexico and the balance is from the Santa Barbara channel area off the coast of California. During fiscal year 1991, 135 claims totaling $807,000 were paid with a year-end Fund balance of $1.1 million. During fiscal year 1992, 110 claims were paid which totaled $562,000 with a year-end Fund balance of $666,000.

Program administration is centralized in Silver Spring, MD, and involves two staff years and $7,000 in administrative costs.

In conclusion, properly constructed artificial reefs can play an important role in recreational and commercial fisheries. These reef habitats provide orientation, shelter, spawning, nursery, and feeding areas for many fish. The National Artificial Reef Plan has successfully promoted safe and effective establishment of artificial reefs, while establishing national artificial reef construction standards. Plans have been drafted or adopted by every Gulf and many Atlantic coastal states. Through state and federal cooperation, there now exists a reasoned and responsible approach to reef development to address the needs and concerns of artificial reef users and other public and private interests.

Messrs. Chairmen, this concludes my written testimony. I thank you for this opportunity to offer our views on oil well and facility abandonment and site clearance procedures and the "Rigs-to-Reefs" program. I would be pleased to respond to any question you or other members of the Subcommittees may have.

TESTIMONY SUBMITTED BY

J.S. FORTENBERRY

ON BEHALF OF

THE NATIONAL OCEAN INDUSTRIES ASSOCIATION

THE

OFFSHORE OPERATORS COMMITTEE

AND THE

AMERICAN PETROLEUM INSTITUTE

BEFORE THE

SUBCOMMITTEE ON OCEANOGRAPHY, GULF OF MEXICO

AND THE OUTER CONTINENTAL SHELF

AND THE

SUBCOMMITTEE ON FISHERIES MANAGEMENT

OF THE

COMMITTEE ON MERCHANT MARINE AND FISHERIES

UNITED STATES HOUSE OF REPRESENTATIVES

JUNE 29, 1993

WASHINGTON, D.C.

Good afternoon, I am Sheldon Fortenberry, Manager of the Offshore Design and Construction Group within Chevron Petroleum Technology Company. Chevron operates the largest number of offshore structures (946) in the Gulf of Mexico. My area of responsibility includes the design, fabrication, installation, inspection, repair, and removal of offshore platforms in the Gulf of Mexico. I have 30 years experience in the petroleum industry of which 25 years has been dedicated to offshore oil and gas operations in the Gulf of Mexico. I am here today on behalf of the National Ocean Industries Association (NOIA), the Offshore Operators Committee (OOC), and the American Petroleum Institute (API). NOIA represents approximately 260 companies, the OOC represents approximately 93 companies, and API represents approximately 300 companies. Although there is some duplication in membership, combined, these companies are involved in all aspects of the oil and gas industry including exploration, production, transportation, refining and marketing.

We appreciate the opportunity to participate in this hearing regarding well and facility abandonment and site clearance for offshore oil and gas operations in the Gulf of Mexico. We are pleased to address this subject because it illustrates the benefits of government and industry working together to accomplish a common goal.

Within this testimony we will discuss the process of platform abandonment and site clearance, including the involved parties and their respective participation. The "Rigs-to-Reef" program, which we feel is an integral part of this process, will also be discussed.

The platforms removed consist primarily of a "deck", or "superstructure", which supports the facilities equipment, a "jacket" which extends from the mud line to above the water surface and supports the "deck", and piles which support both the "deck" and "jacket". An attachment labeled Figure 1 illustrates this typical arrangement.

Removal of offshore platforms becomes necessary when oil or gas production ceases in the last producing well on that lease. The holder of the lease is given ninety (90) days in which to resume production. If production is not restored, or the lease holder is not granted a "Suspension of Production" (SOP), the lease is lost, and the platform must be removed within twelve (12) months from the end of the ninety (90) day period. It is within this period of time operators typically begin the approval process that leads to abandonment and site clearance. There are cases where the lease is still active, but non-producing platforms are removed. Although removal is not required at that time, an operator may remove these platforms because they no longer serve an economic purpose and have become a liability.

The parties involved in platform abandonment include the lease holder, regulatory agencies and contractors that actually perform the removal and cleanup operations. The early stages of the process involve approval requests for; (1) well plug and abandonment, (2) platform removal, (3) site clearance, (4) pipeline abandonment, and (5) artificial reef. For a platform in federal offshore waters, all requests stated above, except the artificial reef requests, are submitted to the Minerals Management Service. The artificial reef requests are submitted to the individual states.

When explosives are used to sever the wells and piles, the Minerals Management Service (MMS) will consult with the National Marine Fisheries Service (NMFS) as required by the Endangered Species Act, Section 7. The NMFS then requires, through the MMS, that their "Incidental Take Statement" be complied with, while the removal operations are conducted. The "Incidental Take Statement" in general describes the process which must be followed in using explosives during removal in order to minimize the impact on endangered and threatened sea turtles. The National Marine Fisheries Service then issues a "Memorandum of Understanding" which is an agreement with the removal applicant, usually the operating company, whereby the operating company agrees to pay for the actual expenses associated with NMFS personnel monitoring endangered species and marine mammals in the area of the structures to be abandoned.

The NMFS is presently proposing that an "incidental take" statement for marine mammals be allowed during the removal of oil and gas platforms in state waters and on the Outer Continental Shelf in the Gulf of Mexico from 1993 through 1997. This request was originally made by API in representing operators in the Gulf of Mexico.

API estimates that 670 structures will be removed from the Gulf of Mexico in the next five years. Most of these structures are in less than thirty feet of water. Bulk explosives, shaped explosive charges, mechanical and abrasive cutters, and underwater arc cutters are all methods that can be used in cutting the piles. The most frequently used procedure for removal is to wash the soil from inside of the piles and lower an explosive charge inside the piles to a point fifteen feet below the mudline, and detonate the charge, which cuts the piles.

Planning for the removal and reefing, if reefing is an option, is carried on concurrently with the approval process. Upon receipt of approvals, the wells are plugged and abandoned at each platform. After this work is completed and prior to removal, each platform is decommissioned. Decommissioning typically involves purging and draining vessels and pipelines, removing facilities, and severing the wells a minimum of 15 feet below mudline.

A contractor experienced with platform removals is hired to remove the platform. The platform superstructure and its facilities are removed prior to severing the piles. After severing the piles, the jacket is removed either as it was originally assembled, or in smaller sections. The entire removal process requires careful planning in order to ensure a safe operation. The age and size of the platforms must be kept in mind when planning these operations.

The platform may be reefed in place, if it is in a designated reef area, moved to a reef site and set on bottom, or brought to shore. The original platform locations in water depths less than 300 feet must be trawled within 60 days of platform removal to verify that the site has been cleared. Trawling is typically performed by an approved local shrimping boat accompanied by an on board surveyor. After completing the site trawling, a "Certification of Site Clearance Verification" report is then issued by the trawler and surveying company. This certification is then forwarded by the operator to the MMS.

The site clearance procedures presently employed have produced results that appear to have satisfied all parties involved. The procedures have changed over time as more has been learned regarding site clearance. Minerals Management Service's "NTL 92-02 Minimum Site Clearance Requirement" is the most recent listing of minimum interim requirements for site clearance and verification.

A site clearance procedural plan is submitted by the lease holder to the MMS with the permit application for platform or structure removal. Previous site clearance procedures required that a high frequency sonar search be conducted over the area to be cleared. Although this is now only required at "Exploratory or delineation wells" (these do not require trawling), many companies still use this tool in identifying bottom debris.

Debris noted on the high frequency sonar is removed by divers prior to proof trawling the area. Proof trawling is the current accepted procedure for verification of site clearance in accordance with MMS NTL 92-02. Two types of trawl nets are now available. A heavier net can be used to locate and remove large debris, and is supplemented by divers when necessary, while the conventional trawl nets are used to proof trawl the area in accordance with the present requirements.

Our industry is responsible for leaving each site cleared so as not to conflict with other uses of the OCS. While the current techniques are effective in determining if a site is clear, we are concerned that some of the requirements associated with the application of these techniques are overly conservative. In particular, we have previously provided data to the MMS that supports significantly smaller area requirements for site clearance surveys. Implementing smaller site clearance area requirements would reduce our costs without significant incremental adverse environmental impact.

The "Rigs-to-Reef" programs, as instituted by each state, have been well received by our industry. Each of the Gulf Coast states has shown interest in receiving platforms as reef candidates. Louisiana and Texas have received the majority of "reefed platforms" because their reef sites are typically closer to the platforms being removed. Since the beginning of the "Rigs-to-Reef" program, approximately 70 structures will have been reefed in the Gulf of Mexico by the end of this year.

Each platform removed has some inherent salvage value, the least of which is the value of scrap steel. In evaluating the use for a removed platform, each option of salvage is investigated, with the possibility of reefing the platform included in this evaluation. Other options considered in this evaluation are; (1) reuse by the operator at another location, (2) sale to an interested party for reuse, or (3) sale to a scrap company.

Another side to the reefing question we wish to address involves the concern over environmental issues. As previously described, platforms consist of three major components; deck, jacket, and piles. Decks are very rarely reefed for a number of reasons; (1) the decks with their equipment are more marketable than the jackets, (2) it is costly to prepare them environmentally for reefing, and (3) contractors will often assume ownership of the decks and equipment under the removal contract. On the rare occasion where decks are reefed, they are typically stripped of facilities equipment leaving only the structural steel as the item to be reefed.

Jackets and the portion of piling within them are typically reefed together. These steel structures have been in the Gulf waters for sometimes 30 years or longer before being removed. We see no pollutant-related environmental concerns over using these structures as artificial reefs. In fact, we believe by reefing these structures versus removing them we are making a positive contribution to the environment. Figure 2 shows a typical jacket placement on bottom.

We would like to compliment the agencies that are involved in the approval and monitoring process for the Gulf of Mexico for both the abandonment and site clearance work, as well as the artificial reef programs. These procedures have evolved along with the increase in abandonments, and we expect these procedures will continue to evolve. Our industry requests at this time an opportunity to continue to participate in the process of redefining these procedures.

Thank you for this opportunity to testify. I'll be happy to answer any questions you may have.

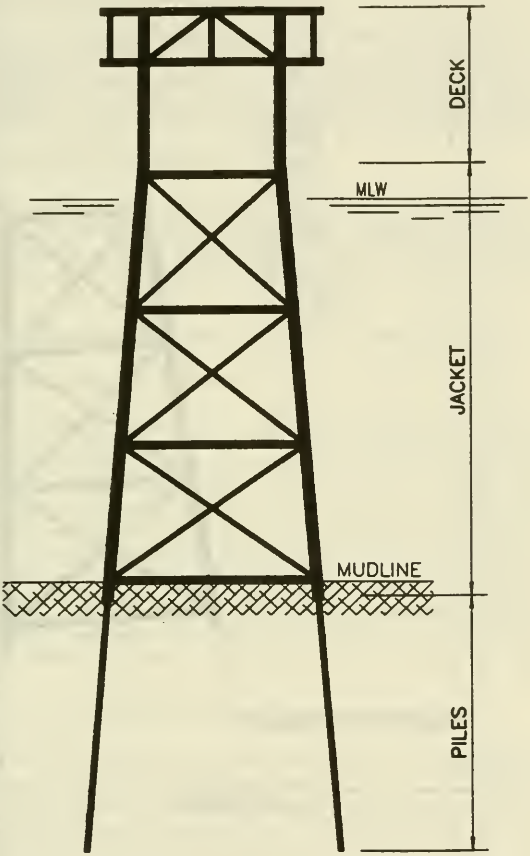

FIGURE 1

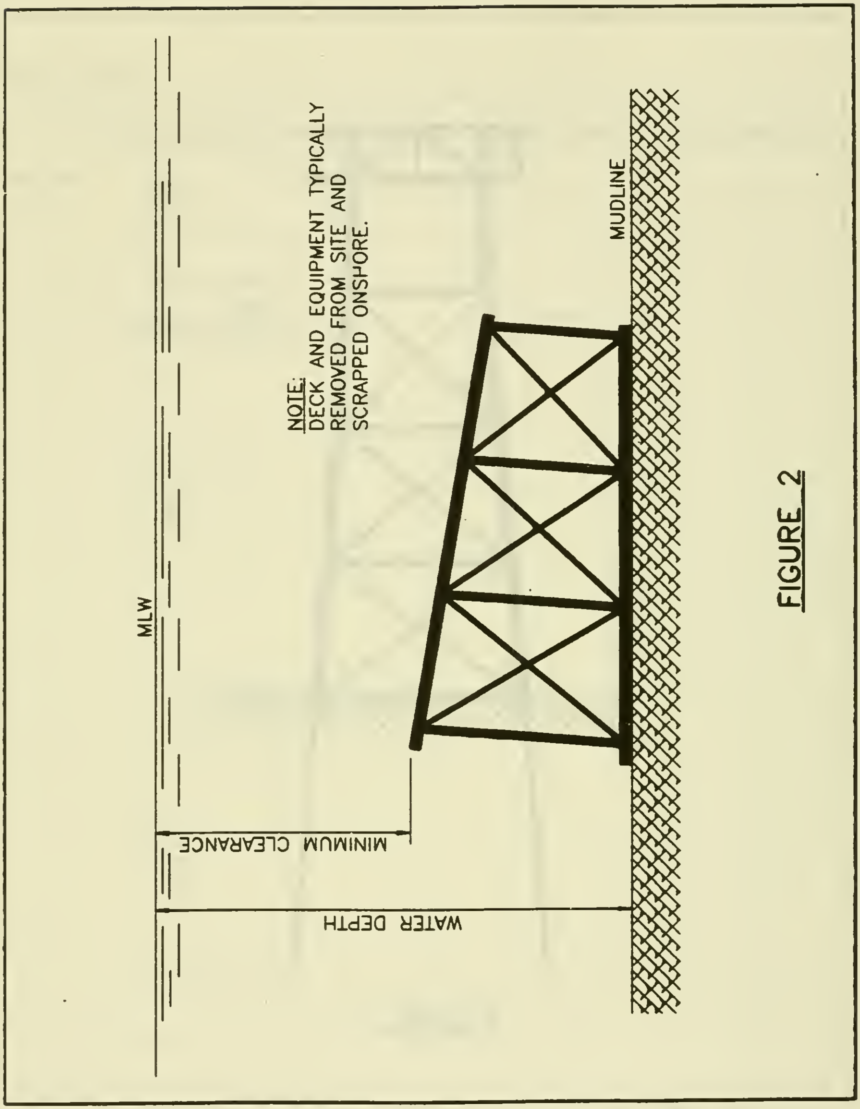
MLW
NOTE:
DECK AND EQUIPMENT TYPICALLY REMOVED FROM SITE AND SCRAPPED ONSHORE.
MUDLINE
MINIMUM CLEARANCE
WATER DEPTH

FIGURE 2

QUESTIONS FOR SHELDON FORTENBERRY FROM CHAIRMAN MANTON

(1) What safeguards are in place to prevent damage to fishing gear?

The area from which the platform is removed is cleared of all residual debris and then trawled in a grid pattern to verify that cleanup has been effected as was described in my testimony of June 29, 1993. The reef areas are designated by the states and are delineated on charts. Reef materials are also marked with navigation aids (generally buoys) if there will be less than 200 ft. of clearance between the tops of the structures and the water surface and in certain other circumstances dictated by Coast Guard regulations.

(2) How often is fishing gear entangled in sunken oil rigs?

We do not know what the frequency of entanglements is at reef sites. The Fisherman's Gear Compensation Fund, managed by the National Marine Fisheries Service, is available to repay fishermen for gear damaged by bottom obstructions. The manager of this fund should be able to estimate entanglements based on claims received in a given time period. The fund office can be reached at (301) 422-2396.

(3) Do the reefs increase productivity or merely concentrate populations of aquatic organisms?

(Note that the following response is also being made to a similar question asked by Chairman Ortiz.)

In general, studies we are familiar with indicate that the fouling growth of algae and invertebrates which cover artificial reef structures plus the physical shelter (as from predators) they provide actually tend to enhance the production of reef-inhabiting species such as grouper, black sea bass, snapper and so forth. Less clear is the effect on wide-ranging or pelagic species such as cobia (ling, lemonfish), mackerels, wahoo, and tunas whose migratory behaviors complicate quantification: While it is clear that many pelagics are attracted to reefs and actively feed around them it is less clear whether the enhanced feeding opportunities available there significantly affect total biomass, numbers of individuals, or reproductive success. In any event depletion by over harvesting on artificial reefs of either reef-dwelling or pelagic stocks is protected against by management controls such as season closures, landing quotas, size restrictions, and creel limits imposed by the Gulf states both individually and jointly with NMFS through the Gulf of Mexico Fisheries Management Council. With proper harvest controls we believe the net effect of Gulf of Mexico artificial reef programs is beneficial to both recreational and commercial fisheries.

(4) What other artificial reef projects are being undertaken by the various coastal states?

Most of our experience has been with the Louisiana Artificial Reef Program which has designated nine artificial reef planning areas off its coast. To date the state maintains 12 actual reef sites comprising jackets of 26 retired oil and gas structures; another five sites using about 16 platforms are planned by the end of 1993. Most, if not all, of Louisiana's artificial reefs have been constructed from surplus oil and gas structures for the simple reason that they have been the most abundant, suitable and economical materials readily available in this area. More information on Louisiana's program is attached.

As for the other Gulf states we are aware that each has a program but have had little direct experience working with them. Florida has a state coordinator but reef siting is handled by their coastal counties. Alabama's designated sites are quite large, we understand, and has employed such materials as concrete rubble, surplus liberty ships, and steel pipes. In Mississippi there is a state coordinator but actual reef construction is accomplished by a private group comprising commercial and recreational fishermen. They have built structures from old railroad boxcars and steel barges. Texas, too, has a state coordinator but we know little about specifics of their program. For more information on state programs we suggest you contact their coordinators:

Alabama: Vernon Minton - Alabama Department of Conservation - (205) 968-7575

Florida: Virginia Vail - Division of Marine Resources - (904) 922-4340

Louisiana: Rick Kasprzak - Department of Wildlife and Fisheries - (504) 765-2375

Mississippi: Mike Buchanan - Department of Wildlife, Fisheries and Parks - (601) 385-5860

Texas: Jan Cubertson - Texas Parks and Wildlife Department - (713) 474-2811

(5) What are the cumulative impacts of these and other artificial reefs being installed by Coastal State fishery agencies?

We are not qualified to answer this question. We refer you instead to the NEPA documentation which should reside with the Corps of Engineers and to trustees such as the National Marine Fisheries Service and the state program offices.

(6) Who benefits most from this program: the oil and gas industry or the fishing industry?

From our perspective and from our contacts with program coordinators, especially in Louisiana, it appears to be a "win-win" situation: It provides the industry with another option to comply with MMS requirements to remove structures at retirement and enhances both fishing success and (probably) the resource base. The "Rigs-to-Reefs" program is a part of a more complete removal and disposal program which provides the industry with a limited incentive for beneficially retiring surplus structures offshore. It is important to note here that in some cases the "Rigs-to-Reefs" option is not the economical alternative - it is often cheaper to haul them ashore for conventional scrapping.

(7) Do some sectors of the fishing industry benefit at the expense of other sectors of the fishing industry?

We are not aware of any imbalance in benefits. More information may be available from the state and federal resource management agencies.

(8) What are the differences in the Texas and Louisiana programs and which program most benefits the fishing industry?

We understand the primary difference involves the way reef areas have been planned and approved, but a complete and accurate response should be solicited from the two states.

(9) Have any environmental impacts been documented for the ongoing rigs to reefs program?

We are not aware of any adverse environmental impacts resulting from this program - only the beneficial ones. Again we suggest that the agencies may have more information on this subject.

(10) How serious is the threat of environmental contamination from traces of oil that may be associated with these structures?

Jackets are typically the portion of the platform that is reefed. As mentioned in the June 29, 1993 testimony; "On the rare occasion when decks are reefed, they are typically stripped of facilities equipment leaving only the structural steel as the item to be reefed. Jackets and the portion of piling within them are typically reefed together. These steel structures have been in the Gulf waters for sometimes 30 years or longer before being removed. We see no pollutant-related environmental concerns over using these structures as artificial reefs."

(11) Can converted rigs be moved by hurricanes, tropical storms, or normal ocean currents?

We are unaware of any reefed platforms being moved from their locations by storms or currents - state program coordinators may have more information on this subject. In fact, we have learned from Rick Kasprzak, Louisiana's Artificial Reef Program Coordinator, that reefed platform jackets in South Timbalier Island OCS Blocks 124 and 128, which were directly in the path of hurricane Andrew, were not moved at all from their permitted locations.

QUESTIONS FOR SHELDON FORTENBERRY FROM CHAIRMAN ORTIZ

(1) What is the Industry's views on the need for increased bonding requirements?

Assumption: Question deals with a financial security plan for ensuring OCS financial responsibility for OCS lease obligations (other than Oil Pollution Act/oil spill requirements).

The attached document, by an industry Ad Hoc Committee on OCS Lease Assignment and Bonding Issues, fully explains the industry's view on bonding requirements for Outer Continental Shelf (OCS) oil and gas leases.

This total document, which includes five (5) separate documents, is as complete a summary of the lease bonding issue as is available today. It reflects government and industry interaction, a near consensus industry plan, and provides the minority non-consensus concerns.

Further questions on lease bonding issues should be addressed to Mr. Harold Cargol, Chairman, Ad Hoc Committee on OCS Lease Assignment and Bonding Issues (504) 595-1037.

(2) You mentioned in your testimony that these structures are sometimes reused. How often is this done? and why isn't this done more often?

Jackets are reused less frequently than decks because they are designed for a specific water depth. Decks are independent of water depth and are therefore more marketable. In the event a jacket being removed matches water depth at a new location, it is considered for reuse.

(3) Information has been provided obout the current Federal role in the "Rigs-to-Reefs" program. Are the Federal agencies, (i.e. NMFS, Coast Guard, COE) properly fulfilling their obligations and responsibilities in the "Rigs-to-Reefs" and other artificial reef programs? If so, how? If not, why?

We have developed a good working relationship with each agency involved in the program and feel they each are meeting their responsibility to the general public and the environment. The time required by each agency for proper reviews and approvals is long, but this has been taken into consideration in our abandonment planning and does not adversely impact our schedules. As we discuss in our response to the next question the permitting process requires a full NEPA review, and with that, of course, a Coastal Zone Management Plan consistency determination.

(4) In terms of the environmental effects of converting oil and gas structures to artificial reefs, have there been any detailed environmental studies done to date? Are Environmental Impact Statements required by the National Environmental Policy Act (NEPA) for "Rigs-to-Reefs?"

A number of environmental studies have been performed on oil and gas structures both during their active service lives and after their conversion to permanent reefs. Environmentally, however, it is noteworthy that most oil and gas structures - unlike most other artificial reef materials - provide artificial reef habitat throughout their service lives. At retirement they are simply stripped of various equipment, decontaminated, and relocated to a permanent reef site. Studies by MMS, NMFS and others of in-service and retired oil and gas structures and of other artificial reef materials are readily available from those agencies and from state artificial reef program managers.

In our experience in the Gulf of Mexico, NEPA review occurs through the COE permit program when state program managers seek pre-approval of designated reef sites and again when materials such as retired platforms are placed in them . Also in our experience full EIS's are seldom, if ever, required. Instead, most NEPA reviews result in Findings of No Significant Impact (FONSI's) for placing structures in pre-designated areas. More detail on this subject is available from state program managers and from the COE.

(5) To what degree is the high number of fish found in association with rigs due to aggregation rather than enhanced production? How does this affect Gulf fisheries?

In general, studies we are familiar with indicate that the fouling growth of algae and invertebrates which cover artificial reef structures plus the physical shelter (as from predators) they provide actually tend to enhance the production of reef-inhabiting species such as grouper, black sea bass, snapper and so forth. Less clear is the effect on wide-ranging or pelagic species such as cobia (ling, lemonfish), mackerels, wahoo, and tunas whose migratory behaviors complicate quantification: While it is clear that many pelagics are attracted to reefs and actively feed around them it is less clear whether the enhanced feeding opportunities available there significantly affect total biomass, numbers of individuals, or reproductive success. In any event depletion by over harvesting on artificial reefs of either reef-dwelling or pelagic stocks is protected against by management controls such as season closures, landing quotas, size restrictions, and creel limits imposed by the Gulf states both individually and jointly with NMFS through the Gulf of Mexico Fisheries Management Council. With proper harvest controls we believe the net effect of Gulf of Mexico artificial reef programs is beneficial to both recreational and commercial fisheries.

Rigs to Reefs in the Gulf

Subcommittee on Oceanography, Gulf of Mexico
and the Outer Continental Shelf; Subcommittee
on Fisheries Management

Hal R. Osburn

June 1993

Mr. Chairman and Members, my name is Hal Osburn and I am the Artificial Reef Program Director with the State of Texas as well as a member of the Gulf States Marine Fisheries Commission Subcommittee on Artificial Reefs.

The basic message I have for you today is that the National Fishing Enhancement Act of 1984, which initiated the development of the National Artificial Reef Plan, and the Rigs to Reefs movement, has been an overwhelming success. This guidance provided to fishery managers has produced biological, social, and economic benefits throughout America's coastal states. Those benefits can be summarized as enhanced fishery resources and increased opportunities for commercial and recreational fishing and sport diving.

Man's impact on our marine resources through fishing mortality and habitat degradation has been tremendous. Artificial reefs have proven to be one of several management tools that help regain lost ground. Virtually every coastal state uses artificial reefs to help accomplish their individual fishery management goals.

In the Gulf, Florida, Alabama, and Mississippi each have extensive areas permitted for artificial reefs. Primary materials used are derelict ships and construction materials, although some rigs have also been placed. Louisiana and Texas, on the other hand, are fortunate to have an abundance of petroleum structures that already serve as unintentional artificial reefs. Habitat limited and overfished reef fish stocks have benefited greatly from these hard substrate oases. The Rigs to Reefs Programs seek, in essence, not to create new artificial reefs, but rather to preserve those that already exist.

The Rigs to Reefs process works by having the state apply for a permit to create an artificial reef from the Corps of Engineers. Strict public comment periods and other siting criteria apply to each rig placement. Having acquired the necessary permits, the state and the petroleum company sign a Deed of Donation which specifies the conditions of transfer of the rig. The rig may be toppled in place or it may be towed to another location. If towed, then normal site clearance rules still apply to the original location. The deed also specifies a contribution of 50% of the realized savings from having donated the rig versus taking it to shore for scrap. These monies are used to cover the cost of administration, buoy marking, and possible liability costs.

In Texas our program goes beyond toppling rigs offshore. Because we have deeper, clearer water closer to shore, we also strive to create new fishing and diving sites which will be more accessible to the major ports.

The desire for more usable reefs has been clearly expressed by the tourism, fishing, and diving industries in Texas who feel they have not adequately benefited from the Gulf's resources. It was these groups who supported the development of a Texas Artificial Reef Plan modeled after the national plan. A unique feature of the Texas Plan was the creation of a citizen advisory committee to provide a high-level forum to discuss differences on implementing the Plan. Members of that advisory committee include shrimpers, environmentalists, petroleum engineers, fishermen and divers.

Conflicts that have arisen have revolved around the slow-pace of creating near shore reefs and the loss of trawlable bottom by the shrimp fleet. The first conflict is really a matter of money, but the Rigs to Reefs monetary donations have provided substantial funds to begin addressing these needs.

The conflict involving trawlable bottom is also yet to be fully resolved, although meetings are being held coastwide with Gulf shrimpers to identify specific areas of concern. Although compromises have been made with the shrimping community, it must also be recognized that moderate artificial reef development will not represent any significant loss of trawlable bottom. In fact, out of 13 million acres of trawlable bottom off Texas, artificial reefs currently only take up 1,800 acres or less than 0.1%.

The preservation of this valuable habitat will lessen the overfishing problems with snapper caused, in part, by the shrimp fleet bycatch of juvenile fish.

Shrimping is important in Texas, but so is tourism and fishing and diving. User groups who profit from publicly owned marine resources must be prepared to share those resources to help achieve maximum benefits for all the people. Artificial reefs can make a much needed contribution to achieving these benefits.

Thank you and I will be happy to answer any questions.

TEXAS
PARKS AND WILDLIFE DEPARTMENT
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ANDREW SANSOM
Executive Director

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July 29, 1993

Honorable Thomas J. Manton
U.S. House of Representatives
Committee on Merchant Marine and Fisheries
Room 1334, Longworth House Office Building
Washington, DC 20515-6230

Dear Congressman Manton:

Please find enclosed responses to the questions you sent me relative to the Rigs to Reefs program in the Gulf of Mexico. I hope these are satisfactory, but, if you need any additional information, please let me know.

I thank you again for the opportunity to testify before the Subcommittee on Oceanography, Gulf of Mexico, and the Outer Continental Shelf, and the Subcommittee on Fisheries Management.

Sincerely,

Hal R. Osburn
Coastal Fisheries Policy Director

HRO:ch

cc: Jan Culbertson - Texas Parks and Wildlife Department

QUESTIONS FOR HAL OSBURN FROM CHAIRMAN MANTON

1) Question
What safeguards are in place to prevent damage to fishing gear?

Response
The specific location of every toppled rig is immediately provided to the Coast Guard which transmits the location on their continuous-running "Notice to Mariners" program on a VHF radio frequency commonly used by Gulf shrimpers. The rig is also marked by an approved Coast Guard buoy detectable by radar until the location is printed on the latest NOAA nautical chart.

2) Question
How often is fishing gear entangled in sunken oil rigs?

Response
It is unknown how often fishing gear is entangled in toppled rigs. However, during a complete divers survey of three rigs, placed as artificial reefs 16 months prior to the survey, no entangled shrimp trawls were found. Because the specific location of every artificial reef is readily available, all vessels that use standard navigational charts and equipment should be able to avoid these reefs. Considerably more fishing gear is likely lost on the 4,000-5,000 identified snags and countless unidentified snags in the Gulf. Many of these snags are relatively small items that change location, such as broken pieces of sunken shrimp boats and other unsalvaged vessels.

3) Question
Do the reefs increase productivity or merely concentrate populations of aquatic organisms?

Response
In the case of invertebrate species such as barnacles, corals, sponges, and other encrusting organisms, a direct increase in productivity is achieved with each artificial reef because these organisms require hard substrate to live. Finfish species, such as snapper and grouper, achieve indirect benefits from increased food supplies, shelter, and spawning areas. Although these benefits are more difficult to quantify, there can be little doubt that habitat-limited species, such as reef fish, have increased their productivity due to artificial reefs. This increase is partly achieved through a reduction in the natural mortality of reef fish that need reefs to improve their chance of survival. This is somewhat analogous to increasing the survival of water-dependent animals by placing more oases in a desert. The overall effect of artificial reefs in the Gulf will be an increase in the biodiversity and abundance of reef-associated species. Directed Gulf fisheries for reef fish, both commercial and recreational, will be allowed increased opportunities for harvest in the long-term because of the presence of artificial reefs.

QUESTIONS FOR HAL OSBURN FROM CHAIRMAN MANTON
Page 2

4) **Question**
What other artificial reef projects are being undertaken by the various coastal states?

Response
While Texas and Louisiana focus on Rigs to Reefs, Florida, Alabama, and Mississippi rely primarily on other materials of opportunity, including derelict vessels, construction material, and oyster shell. Coordination among these states through the Gulf States Marine Fisheries Commission Artificial Reef Subcommittee helps to assure that any materials of opportunity used will minimize problems and maximize benefits. All of the states have active artificial reef programs, with Florida leading in total number of sites.

5) **Question**
What are the cumulative impacts of these and other artificial reefs being installed by Coastal State fishery agencies?

Response
Artificial reefs are one of several fishery management tools that managers use to try to achieve optimum benefits from their marine resources. Optimum benefits requires a balance of biological, social and economic factors. Artificial reefs in the Gulf have provided a positive impact on each of these factors. Overfished and habitat-limited reef fish stocks have benefited biologically through an increase in population abundance and distribution. Social and economic benefits have been maximized by increasing the opportunities for consumptive and non-consumptive activities in the Gulf by literally millions of sport anglers and divers. Increased recreational expenditures on the coast translates into economic gain for local businesses as well as nationwide outdoor equipment manufacturers. Commercial reef fish fishermen also gain directly due to increased fish stocks. Negative impacts on Gulf shrimpers is minimal since artificial reefs cover less than 0.1% of available trawlable bottom.

6) **Question**
Who benefits most from this program: the oil and gas industry or the fishing industry?

Response
Social and biological benefits are difficult to quantify in economic terms and, therefore, direct comparisons of the monetary savings by the petroleum industry from rig donations versus the benefits of rigs as reefs for fishermen and divers may be hard to do. However, it should be noted that virtually every coastal state has active artificial reef programs that spend state revenues to construct reefs. Only Texas and Louisiana have the benefit of ready-made reefs that also result in monetary donations to the State of 50% of the realized savings by the petroleum company. The amount of money saved by the petroleum companies is actually a small percentage of their total expenditures while the reefs they create are a large percentage of the quality fishing and diving sites. In this sense, the fishing and diving industries are the greatest beneficiaries of the Rigs to Reefs program.

7) Question
Do some sectors of the fishing industry benefit at the expense of other sectors of the fishing industry?

Response
The offshore shrimping industry has publically stated they feel they are being negatively impacted. However, there is little evidence that any significant impact has occurred. Artificial reefs take up less than 0.1% of trawlable bottom and account for less than 0.5% of the identified trawling obstructions in the Gulf. In addition, all artificial reefs are accurately marked and can be avoided by shrimpers. The need for artificial reefs is due in part to the overfished status of red snapper which was a result partly of the tremendous number of juvenile red snapper killed as bycatch in shrimp trawls. This bycatch of red snapper and other recreational and commercially important species has had a documented negative impact on other fishing industries in the Gulf.

8) Question
What are the differences in the Texas and Louisiana programs and which program most benefits the fishing industry?

Response
The Texas and Louisiana Artificial Reef Programs are very similar in that the heart of both programs is Rigs to Reefs. With a greater abundance of petroleum structures, Louisiana has more Rigs to Reefs activity than Texas. They have also chosen to restrict rig toppling to nine predetermined zones scattered off their coast, but primarily relatively far offshore. Louisiana anglers benefit from the large number of nearshore petroleum structures still operating, while Texas nearshore anglers, particularly on the south coast, have much fewer fishing sites from which to choose. For that reason, the Texas program has chosen to remain more flexible with artificial reef site selection as well as seeking to increase the number of nearshore sites for the benefit of the fishing and diving industries.

9) Question
Have any environmental impacts been documented for the ongoing rigs to reefs program?

Response
Detailed studies have documented the positive biological and ecological benefits of placing petroleum structures in the marine environment as artificial reefs. Prior to placement, these structures must be certified as free of hydrocarbons or other hazardous wastes as listed in current regulations promulgated by the Environmental Protection Agency pursuant to the Resource Conservation and Recovery Act of 1976. An Environmental Impact Statement (EIS) as defined by the National Environmental Policy Act has been done for the placement of petroleum structures in the Gulf. Specific EIS's for each new artificial reef are not required because of these previous studies and the currently adequate coordination among environmental agencies during the permitting process.

10) **Question**
How serious is the threat of environmental contamination from traces of oil that may be associated with these structures?

Response
Because petroleum structures must be certified as free of hydrocarbons before placement as artificial reefs, the threat of environmental contamination from traces of oil is considered to be minimal.

11) **Question**
Can converted rigs be moved by hurricanes, tropical storms, or normal ocean currents?

Response
It is possible that a large hurricane could cause some movement of toppled rigs. However, rigs are currently placed at the center of one quarter mile square sites, thus relatively small movement will not result in displacement off a site. In the unlikely event that the rig were to move off site, the state would immediately mark the new site as well as provide notification to all shipping interests. In addition, the structure would either be repermitted for the new location, returned to the original site, or removed completely.

First in Fisheries

Texas Shrimp Association

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Testimony
of
Wilma Anderson, Executive Director
Texas Shrimp Association
before the
Subcommittee on Oceanography, Gulf of Mexico,
and the Outer Continental Shelf, and the
Subcommittee on Fisheries Management
June 29, 1993

Mr. Chairman and Members of the Subcommittees:

My name is Wilma Anderson, I am the Executive Director of the Texas Shrimp Association (TSA), I am also an owner of shrimp trawlers that operate in the Gulf of Mexico. TSA is an association representing a majority of the Texas offshore shrimp trawlers and a significant number of shrimp trawlers from the other gulf states.

We appreciate the invitation to present comments before the Subcommittee on the well and facility abandonment and the site clearance pertaining to the offshore oil and gas operations in the Gulf of Mexico. Also, the "Rigs to Reefs" program advantages and disadvantages of disposing of offshore oil and gas platforms in this manner.

Industry Background:

I would like to take a few minutes and to give a brief history to the Subcommittee, why the shrimp fishery is concerned with the unfortunate current activities now affecting the Gulf and how those relationship affect the shrimp fishery.

As the Subcommittee is aware, the commercial shrimp fishery is the most valuable fishery of the United States. The Gulf of Mexico is the major economic contributor in value of that fishery. Texas leads in value and Louisiana leads in volume, this combination of value and volume represents over eighty (80%) of the total U.S. fishery economic value.

The trawlers are designed and equipped for long range mobility for a mode of operation from Texas to Florida, all frequent the same fishing grounds, encounter the same favorable and detrimental factors, therefore, when an area of the gulf is affected the entire gulf shrimp fleet is affected.

For decades the shrimp fishery has utilized the vast fishing grounds and commercially harvested the yield of a yearly renewable shrimp resource. If shrimp is not harvested within its yearly life cycle, its economic value is lost to the fishery. It is not a depletable reserve, such as oil and gas production.

As the extractive resource diversity of the gulf unfolded, the traditional fishing grounds of the trawlers became concentrated into limited production areas, from the encroachments of diversity for navigational shipping of crude, petro-chemicals, commodities, etc., and the expanding placements of offshore oil and gas activities.

Shrimp Fishery Scenario and Concern:

It was the original understanding of the shrimp fishery that as the oil and gas reserves depleted and those facilities became nonproductive, those facilities would be removed from the state and federal waters and traditional fishing grounds would be returned to the shrimp fishery free of debris.

A changing economy now affects the offshore facilities resulting in lease transfers from majors to independents, whereas, the financial instability of the independent is resulting in nonproductive well and facility abandonment, removals and clean up, storm damaged platforms toppled in place and scattered debris.

Where does this leave the shrimp fishery, who utilizes the yearly renewable resource of shrimp from the Gulf in fresh seafood to the public, provides hundreds of thousands of jobs and an economic base of billions to the Gulf States: The fishery remains confined to concentrated fishing grounds with the inability to access the traditional productive fishing grounds that would enhance the fishery economic base.

In addition, is the concern of the shrimp fishery in the use of rigs to reefs, that has resulted in retaining in place toppled nonproductive facilities and further loss of fishing grounds through reef placements inconsistent with the shrimp fishery. The loss of Title IV, Fishermen's Contingency Fund, under the 1978 OCS Lands Act Amendment for gear loss in state or federal waters once a platform or rig has been transferred to the permittee. The use of a General Permit for rigs to reefs by the Corps of Engineers that would void public input, and the inadequate co-management of the Rigs to Reefs Program between the Gulf of Mexico Fishery Management Council and the State Agencies. Too many areas remain unanswered, improperly managed, as the shrimp fishery waits on the sideline.

The following is the association's recommendations for consideration and review:

Well and Facility Abandonment: Site Clearance:

The shrimp fishery recommends, that the 1992 provisions of the Outer Continental Shelf Lands Act, remain in force and effect, in the planning removal of all platform and rig removals and the site clearances provisions corresponding to those removals. We also, recommend that platform and rig removals be returned to shoreside for salvage disposal and/or recycling.

In consideration of the extensive amount of platform and rig removals, in the near future, and the resulting massive specie kill from explosive use in the Gulf of Mexico. The shrimp fishery recommends, a complete surveillance during the use of explosives, and continued surveillance of offshore, inshore and shoreside for several days following the detonation. The gulf currents are a relating factor for area of strandings, the fishery maintains this is a necessity, in order, for the shrimp fishery to avoid exposure of non-related stranding mortalities of endangered and threatened species.

Our concerns relates to the revised 1992 TED regulations, which contains a clause, that if there is an area of heavy turtle strandings, that area is subject to closure to the shrimp fishery.

End-of-Lease Costs:

The shrimp fishery recommends, that the Minerals Management Service, Regional Director, ensure that before a transfer of lease to a smaller independent, the independent demonstrates the financially ability to meet the "end-of-lease" costs; or a contingency clause attachment to the transfer of lease, that the original lease permittee will provide a supplemental bonding for end-of-lease costs, in the event, the subleasee cannot perform the end-of-lease costs. One must question the rationale of the bonding originally at $50,000 and the Notice of Proposed Rulemaking increase in bonding to $500,000, when the anticipated cost for platform and rig removal, well capping and site clearance is $1 to $2 million dollars.

Long-range financial planning ensures that a sound environment is preserved in the Gulf at the time of end-of-lease.

Fishermen's Contingency Fund

The Gulf of Mexico has a vast amount of offshore drilling facilities of oil and gas activities. The majority of these activities are off the coast of Texas and Louisiana.

One must consider that from the vast activities there will be substantial material lost overboard from the platform structures, barges, structure removals and hurricanes.

This does create hang obstructions for the shrimp trawlers, which incur fishing gear loss and tear up, in some instances damage to the trawler and the loss in fishing time returning to port for repairs. Trawlers incur thousands of dollars in gear and damage replacement cost.

The shrimp industry and the offshore facilities have worked cooperatively with the understanding that capped wells will be properly marked, pipelines and material debris will be recovered and/or removed to minimize fishing gear loss to the trawlers. In the event, that hang obstruction resulted in gear damage, trawlers were compensated through offshore drilling activities funding to the Title IV, Fishermen's Contingency Fund.

Rigs to Reefs Program (Artificial Reefs)

Mr. Chairman and members of this Subcommittee, the shrimp fishery is not against fishery enhancement for all user groups, but that enhancement must be beneficial and properly managed to avoid user conflicts.

We do feel, that the present Rigs to Reefs Program is not in compliance with the National Fishing Enhancement Act of 1984 in plan development, fishery management procedures and standards one (1) through four (4).

The Fishery Management Council has been negligent or perhaps I should state appear unaware of their mandate in their management role of this program. Perhaps since all funding has been disbursed to the state level and no funding to the Council level impedes the Council in management of this program.

There has been possibility two (2) Rigs to Reefs Committee meetings at the Council level in the last six (6) years. One (1) implementation of a Special Management Zone designation off Alabama relating to a carbody reef. The Special Management Zone did not contain Standards one (1) through (4), plan development, management, monitoring, sound environmental installations, safety related factors, or if an overfishing status would occur. Coast Guard advised, they could not enforce because of location, therefore, it would be on an individual basis to appraise of violations. This designation was recalled for further review.

Our experience with the Texas program is a "dash for the cash". In our opinion, the rig donation funding accepted is minimal in relation to removal cost, but based on the ultimatum from the oil and gas industry, if we have to move it any distant, we will take it to shore. Rather than lose the funding, the agency and committee are allowing sitings to meet the demands of the facilities, while the shrimp industry incurs loss of fishing grounds. The funding donation is insufficient to meet the guidelines of the National Fishing Enhancement Act in long term fishery management and monitoring, environmental and safety related to material deterioration over a time span.

The Texas shrimp fishery has one (1) representative on the ten (10) member Artificial Reef Advisory Committee. We are constantly out voted in reef sitings, eventhough we have given designated sitings. The type of materials used, which some, we feel are in violation of Marpol, such as, blocks of fly-ash, jungle jims and concrete culverts. Each time we place objection to loss of fishing grounds, we are advised, this is mitigation for bycatch, enhancement for tourism, sportsfishing and divers.

Mr. Chairman and members of the Subcommittee the shrimp fishery is under a congressional mandate to address bycatch in shrimp trawls by January 1994. We contend, that if we are to continue to lose productive fishing grounds to Rigs to Reefs, under the stipulation that it is bycatch mitigation this must be incorporated into the fishery management plan of the programs and at addressed by the state and council levels.

I constantly address this bycatch mitigation factor at the state level in committee meetings and at the council level at the time of designation of the Special Management Zone.

Industry is aware that as platforms, rigs, and other materials that are donated for use as reefs will eventually deteriorate and disburse and/or scattered from severe hurricanes will create obstruction hangs resulting in fishing gear loss and lost fishing time to the trawlers. Under the Rigs to Reefs Program the Title IV, Fishermen's Contingency Fund becomes void and there has been no fund established at the state level, this leaves the fishery fully exposured for all expenses to be born by the trawlers.

The shrimp industry recommends, that since the majority of all Rigs to Reefs are within the Exclusive Economic Zone, it is appropriate that the Title IV, Fishermen's Contingency Fund be retained and administered by the National Marine Fisheries Service, as an intricate part mandate under the Rigs to Reefs Program. The funding to this program would be through a pro-rata share from the active oil and gas producing facilities and the donation funding to the Rigs to Reefs Program.

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July 28, 1993

Honorable Thomas Manton
U.S. House of Representatives
Merchant Marine & Fisheries
Room 1334, LHOB
Washington, D.C. 20515-6230

Honorable Solomon Ortiz
U.S. House of Representatives
Merchant Marine & Fisheries
Room 1334, LHOB
Washington, D.C. 20515-6230

Dear Congressmen:

Re Letter June 29th Questions pertaining to Site Clearance and Rigs to Reef in the Gulf of Mexico

The shrimp industry's main concern in the Rigs to Reef Program is the advancement forward without a data base of potential benefits or potential negatives effects on specie populations, and effects on other direct commercial fisheries. This program should be slow in advancement until monitoring of the present reefs reflect the positive and/or negative effects, at this date, this information is not available.

Rigs to Reef should be managed in the same respects as any other fishery using the Magnuson Fishery Conservation & Management Act standards and 602 guidelines. The Gulf Council and State Agencies have not developed fishery management plans regarding these areas that are encouraging additional recreational entries through enticement by use of designated location of areas of aggregation and congregation of species that have the potential to be overfished by this process, rather then the sportsmanship of seek and catch in the wild.

QUESTIONS SUBMITTED BY CONGRESSMAN ORTIZ

1) Does the shrimping industry have any concerns over the potential increase in pipeline abandonment as stated in MMS testimony?

Pipelines not removed pose continuing threat to shrimp trawls. Constant bottom changes from ocean currents pose the problem of uncovering pipelines which fishing trawls will become entangled.

Normally, the trawler is unable to retrieve the trawls and has to cut the trawl main cables loose from the hoist, therefore, all fishing gear: cables, bridles, doors and nets are lost. This average costs to the trawler is approximately $8,000 plus per trawl side and/or if both sides lost $16,000 plus, in addition, lost fishing time to return to port to replace lost gear.

The trawl gear of the vessel is not covered by insurance once the trawl gear goes overboard to trawl, loss through bottom obstructions is not covered under the policy.

Insurance coverage of trawl gear is limited: Example: In the event the vessel's trawls are entangled on a bottom obstruction and severe weather is moving in and the vessel is immobilized or unstable, cutting loose the trawls to allow the vessel to be mobilized for safety of vessel and crew is a circumstance which coverage would be allowed, but must have substantiating evidence.

2) Does the shrimping industry have any concern with a recent MMS decision to allow the permanent abandonment of several wells in water depths greater than 1000 feet without having the site cleared down to the mudline?

No Objection: As long as there is no moveable debris left on site that can be moved/scattered by hurricanes and/or ocean currents that would be a future detriment to the shrimp trawls in the current remaining traditional fishing grounds.

3) To what degree is the high number of fish found in association with rigs due to aggregation rather than enhanced production? How does this effect Gulf fisheries?

Testimony presented by Sportsfishing Institute quoted 20 - 50 times greater in aggregation/congregation which would represent enhanced production for recreational take. The increased production take through aggregation/congregation could lead to: (a) specie over fishing, (b) predator prey enticement on a variety of smaller species (juvenile fish, crab, shrimp, etc) at which an inbalance in nature occurs, (c) directed commercial fisheries would remain stagnate for quota growth from a decrease in future spawners of recruitment to the specie population stock.

QUESTIONS SUBMITTED BY CONGRESSMAN MANTON

1) What safeguards are in place to prevent damage to fishing gear?

Under the present MMS mechanism damages to fishing gear relating to oil and gas production is compensated through the Fishermen's Contingency Fund.

Once the oil and gas industries donate the well/platform for reef material to the state agencies and the agency takes possession the oil and gas industries liability ceases at that point. Lost fishing gear is no longer covered under the Fishermen's Contingency Fund. State Agencies have not established a fund to compensate for lost fishing gear associated with Rigs to Reef installations.

The responsibility for loss of fishing gear associated with Rigs to Reef remains unanswered, it is a state managed program, yet minimal Rigs to Reef are within state waters and the majority of Rigs to Reef are in the Exclusive Economic Zone, who has the liability and to which agency does the shrimp fishery look to for compensation?

2) How often is fishing gear entangled in sunken oil rigs?

Per Mr. John Hall's statement of June 29th: Since 1978 1,287 claims have been paid for approximately $ 6.7 million. Ninety-five percent of the claims are from the Gulf of Mexico and the remaining five percent is from the Santa Barbara, California, area.

Fiscal Year 1991: 135 claims totaling $807,000
Fiscal Year 1992: 110 claims totaling $562,000

3) Do the reefs increase productivity or merely concentrate populations of aquatic organisms?

Productivity increase: This information would have to be obtained from the State Agencies and National Marine Fisheries Service who are the designated monitors of the reef program.

Testimony presented at the hearing stipulated that there was increase productivity, but those testimonies did not have any supporting data as to the numbers or percentages per species.

Aquatic organisms population concentration would vary according to reef location of the gulf bottom structure (water depth, live bottom, sand bottom, rock bottom, mud bottom, etc.).

4) What other artificial reef projects are being undertaken by the various coastal states?

In addition to the oil and gas structures, coal fly ash in block form from Power & Light Companies, carbodies, concrete culverts on barges, oil and gas surplus shoreside materials of drilling pipes and recent Texas A&M obsolete vessel.

5) What are the cumulative impacts of these and other artificial reefs being installed by Coastal State fishery agencies?

The aggregation and congregation of fish population will enhance production, while enticing specie over fishing status from the recreational sector. The shrimp fishery incurs loss in trawlable bottom areas throughout the gulf. The direct commercial reef fish quotas will remain stagnate from surplus specie removal which decrease stock populations and as specis recruitment declines from recreational over fishing of potential spawners this will rebound to the shrimp trawl fishery, under the assumption, as the contributing factor for specie decline.

Example: In just one area the recreational take from the Artificial Reef off Alabama was quoted at the Gulf Council meeting to be 550,000 pounds to 750,000 pounds of red snapper per year. This one area alone represents tremendous take of potential spawners which contributes future recruitment to the specie stock.

What the shrimp fishery is stressing concerning the Rigs to Reef Program is, if the recreational sector (tourism, marinas and sports fishermen and charter boats) "for the dollars and enjoyment for directive fishing locations rather then seek and find in the wild," to over fish the specie status through the enticement and encouragement by the Rigs to Reef Program, that is their prerogative. Then that sector cannot expect to hold the commercial fisheries responsible for specie decline, stagnate commercial quotas and attempt to place more stringent regulations on the commercial sector that provides billions of dollars to state and coastal economies in dockside landing values, and jobs and payroll by their overtake, because no recreational fishery management plan is in place to govern the allowable catch directly from an Artificial Reef.

What the shrimp fishery is stating, if the Rigs to Reef Program is going to take trawlable bottom, under agencies pretense, as a means of a mitigation factor for the incidental take of bycatch in shrimp trawls, then the shrimp fishery which is under a congressional mandate to study and reduce bycatch should have incorporated into the bycatch mandate an allowable offsetting mitigation credit. This is always in discussion at the council level and state level, but to date no mitigation credit has been given.

6) Who benefits most from this program: the oil and gas industry or the fishing industry?

Oil and gas industry in reduced cost of removal and write offs and directed recreational by means of aggregation and congregation of species at specific locations.

7) Do some sectors of the fishing industry benefit at the expense of other sectors of the fishing industry?

Yes: Recreational. Directed commercial reef fisheries remain limited under a quota system with its restrictions .

8) What are the differences in the Texas and Louisiana programs and which program benefits the fishing industry?

Louisiana has specific number of eight (8) designated sites offshore with only one (1) inshore site. Texas has no stipulated number of sites and scattered inshore and offshore. Louisiana's would be more economical in cost of monitoring the sites, where Texas would have increase cost in monitoring because of the numerous locations and their variations inshore/offshore locations along a 400 mile coastline.

Benefits would depend upon the fishery: Recreational will benefit from inshore and offshore siting of Rigs to Reef. The shrimp fishery requests that siting remains outside the traditional fishing grounds and specific in number and location.

9) Have any environmental impacts been documented for the ongoing rigs to reefs program?

This question would have to be answered by the State and Federal Agencies. They are the managers and monitors of this program.

10) How serious is the threat of environmental contamination from traces of oil that may be associated with these structures?

Oil contamination occurs in the Gulf frequently: in the form of slicks, heavy crude wash-up on beaches, etc., but documentation of source is seldom published, other then if it is a heavy spill from a tanker or barge.

11) Can converted rigs be moved by hurricanes, tropical storms or normal ocean currents?

This is the shrimp industry's concern: During Hurricane Andrew approximately 200 oil and gas platforms sustained damage: approximately 15 platforms were toppled and dislocated (areas unknown) by the storm and others were severely damaged.

Once these rigs are subjected to a period of time in salt water, electrolysis sets in and the platform jacket (metal) begins to deteriorate and break down occurs. At what given time span this deteriorating will occur has not been established nor discussed concerning the useful life of oil and gas relative materials for the Rigs to Reef Program.

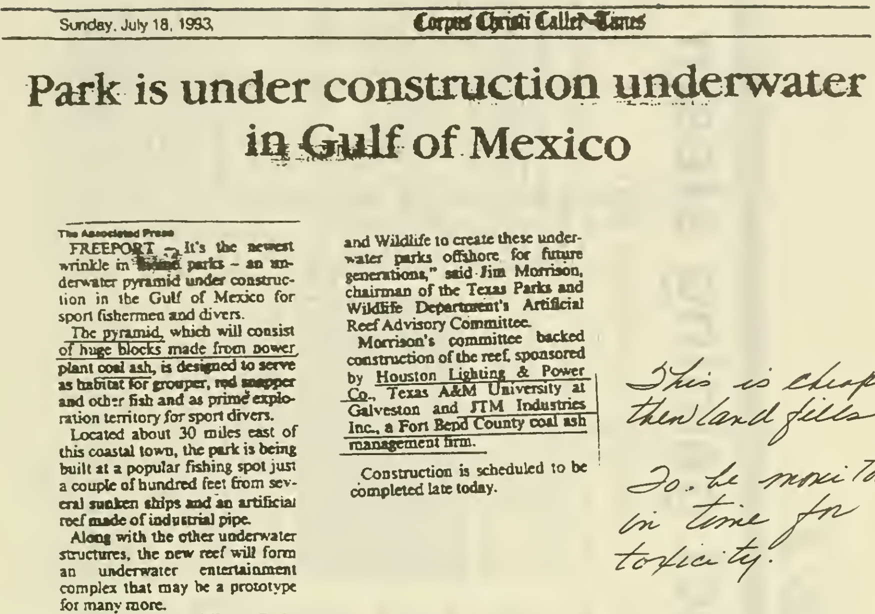
Once this occurs platform material will be scattered through out the Gulf by hurricanes, tropical storms and ocean waves and trawl gear will be exposed to hangs and trawl gear damage. This is part of the fishery rationale, that a Fishermen's Contingency Fund must be implemented to cover fishing gear loss that will be incurred.

Sincerely,

Wilma Anderson

Wilma Anderson
Executive Director

Enclosures



Sunday, July 18, 1993 Corpus Christi Caller-Times

Park is under construction underwater in Gulf of Mexico

The Associated Press

FREEPORT — It's the newest wrinkle in [illegible] parks – an underwater pyramid under construction in the Gulf of Mexico for sport fishermen and divers.

The pyramid, which will consist of huge blocks made from power plant coal ash, is designed to serve as habitat for grouper, red snapper and other fish and as prime exploration territory for sport divers.

Located about 30 miles east of this coastal town, the park is being built at a popular fishing spot just a couple of hundred feet from several sunken ships and an artificial reef made of industrial pipe.

Along with the other underwater structures, the new reef will form an underwater entertainment complex that may be a prototype for many more.

"It's the intent of Texas Parks and Wildlife to create these underwater parks offshore for future generations," said Jim Morrison, chairman of the Texas Parks and Wildlife Department's Artificial Reef Advisory Committee.

Morrison's committee backed construction of the reef, sponsored by Houston Lighting & Power Co., Texas A&M University at Galveston and JTM Industries Inc., a Fort Bend County coal ash management firm.

Construction is scheduled to be completed late today.

This is cheaper
then land fills!

To be monitored
in time for
toxicity.

VALLEY

Saturday, July 17, 1993 Valley Morning Star

Rig-to-reef project gaining steam

Sunken platforms provide habitat for coral and fish

By MARK WAITE
Star News Staff

PORT MANSFIELD — The Texas Parks and Wildlife Department artificial reef program has been expanding along the coast this year, inducing proponents to compare the project to a Hilton Hotel for fish.

To date, the Rigs to Reefs program has made artificial reefs out of 17 former oil and gas platforms, raising $2.5 million toward future artificial reefs.

More than 4,000 oil and gas production platforms are located in the Gulf of Mexico, of which about 40 percent are estimated to become unprofitable by the year 2000, according to the Parks and Wildlife Department.

In late May, Smit Americas Inc. donated two rig structures in shallow water close to Port Mansfield.

The rigs were towed about six miles and sunk at the Parks and Wildlife Department's Liberty Ship artificial reef site 15 miles southeast of Port Mansfield.

Hal Osburn, Parks and Wildlife coastal fisheries policy director, said to meet U.S. Coast Guard water depth clearance requirements the rig structures must be cut creating four structures.

The Coast Guard requires the artificial reefs be no closer than 30 feet to the surface.

"The Artificial Reef Fund financed the cutting of the rigs because of the importance of saving this reef fish habitat," Osburn said.

"It cost almost $100,000 but it was worth it to preserve fishing and diving opportunities."

The Smit Americas rigs were only eight miles offshore and the oil company did not save any money by making the donation, he said.

The department was especially willing to pay to preserve the Port Mansfield rigs since the South Texas area has the least number of rigs available to place as artificial reefs, Osburn said.

"The structures are 60 to 70 feet from the surface and well within the range for safe recreational diving," Osburn said.

"All of the other rigs we've placed so far have been in water too deep for most divers."

Tim O'Leary, owner of American Diving in Port Isabel, said the rigs were placed to butt right alongside the ships.

"They brought them (the rigs) up with barnacles and coral on them and laid them right there. So the reef life has just been transferred," he said.

"What this is doing is increasing the fish life enormously. There's just no comparison," O'Leary said.

He said there is a smorgasbord of reef fish out at the Liberty Ship site, including manta rays, sharks, angelfish, jewfish and ling.

> "What this is doing is increasing the fish life enormously. There's just no comparison."
> — Tim O'Leary
> American Diving, Port Isabel

The Port Isabel-South Padre Island Artificial Reef Committee donated their lease seven miles southeast of the South Padre Island jetties to the Parks and Wildlife Department last November.

That will enable the state to take over that site and possibly develop a reef there.

"The department's current sites are too isolated for normal recreational users," John Thobe, a member of the local artificial reef committee wrote in conveying the lease.

The SPI site is four miles offshore in 85 feet of water.

This month the Parks and Wildlife Department announced Global Marine Inc. of Houston has donated $385,000 to the Texas Artificial Reef Fund, the largest donation in the history of the rigs to reef program.

The donation represents half of the company's realized savings from converting an offshore natural gas production platform 100 miles southeast of Galveston into an artificial reef, versus salvaging it on shore.

The platform — the length of a football field — will be toppled to the gulf bottom.

"This is a landmark day for the Texas Artificial Reef Program," said Andrew Sansom, executive director of the Texas Parks and Wildlife Department.

"One of the dominant themes in our work today is partnerships between government and private business and this is an excellent example."

Senate Bill 5 sponsored by Sen. Eddie Lucio, D-Brownsville and Sen. Buster Brown, D-Lake Jackson, in 1989, set up the artificial reef program. The first rig was donated in July, 1991.

Sport Fishing Institute

1010 Massachusetts Ave., N.W., Washington, D.C. 20001 (202) 898-0770, Fax (202) 371-2085

TESTIMONY OF THE SPORT FISHING INSTITUTE
ON THE
NATIONAL RIGS-TO-REEFS PROGRAM

PRESENTED BEFORE THE SUBCOMMITTEE ON OCEANOGRAPHY, GULF OF MEXICO, AND OUTER CONTINENTAL SHELF, AND THE SUBCOMMITTEE ON FISHERIES MANAGEMENT

TINA L. BERGER
DIRECTOR
ARTIFICIAL REEF DEVELOPMENT CENTER

SPORT FISHING INSTITUTE
JUNE 29, 1993

The National Non-Profit Fish Conservation Organization

Thank you Chairmen Ortiz and Manton and subcommittee members for providing this opportunity to express the views of the Sport Fishing Institute (SFI) on the successful implementation of the National Artificial Reef Plan and Rigs-to-Reefs Program. I am Tina Berger, Director of the Artificial Reef Development Center (ARDC) and Marine Research Specialist at SFI. For over three years I have been involved in the compilation and assessment of artificial reef development, management, and research activities throughout the coastal United States. For nearly a decade, SFI, through the ARDC, has been a key player in the formulation of the national policy on artificial reefs, and in the subsequent implementation of this policy at the federal, regional and state levels.

The Sport Fishing Institute, a non-profit fisheries conservation and education organization, represents the interests of the sport fishing and boating industry and tens of millions of American citizens who rely on recreational fishing as a healthy and wholesome leisure activity. Sound fishery management programs and policies, such as the National Artificial Reef Plan, and Rigs-to-Reef Program, which provide for viable and accessible fishery resources are paramount to providing robust recreational fisheries and to fostering a stable economic climate in which sport fishing related businesses can thrive.

Artificial habitats, whether it be an intentionally-placed artificial "fishing" reef or a petroleum platform, have been found to increase local plant and animal life, attract large numbers of pelagic fish (primarily in offshore waters), and increase local production of many other species of fish. For many high profile habitats, such as petroleum platforms and reefs composed of large vessels, fish can be found in concentrations of 20 to 50 times greater than in nearby soft-bottom areas. A single 200 foot platform jacket (submerged portion of the petroleum structure), for example, provides several acres of hard substrate that fosters the growth of algae, barnacles, mussels, anemones, sponges and other attached organisms. These organisms, in turn, form the base for a highly complex food chain and also create hiding places for small fish and invertebrates. The success of artificial reefs has been largely due to their contribution of new habitat and by increasing local populations by expanding the number, range, size and diversity of many highly desirable fish and shellfish.

It is for these reasons that artificial reef habitats are especially important in the region such as the Gulf of Mexico where natural hard-bottom habitat is at a minimum. In Louisiana alone, it is estimated that artificial habitat (both permitted reefs and petroleum platforms) constitute over 90 percent of all hard-bottom habitat in waters less than 300 feet deep. Gulf-wide, artificial reefs are estimated to account for nearly 30 percent of all hard-bottom habitat. Needless to say, the contributions of this habitat to the availability and perpetuation of the region's fishery resources is enormous.

In addition to these enormous environmental benefits, artificial reefs provide an equally large benefit to local economies in coastal communities. SFI has estimated that in 1991 marine recreational fishing activity generated nearly $17.6 billion to the national economy, including $4.5 billion in wages and salaries for the approximately 290,400 full-time equivalent jobs created. Clearly, marine recreational fishing provides enormous benefits to the social and economic well-being of the entire nation, with artificial reefs playing an important role in providing these benefits. **In 1990 alone, an estimated 1.64 million marine recreational fishing trips were made to over 670 permitted artificial reef and petroleum platform sites located throughout the coastal U.S.** Based on average per trip expenditure data from 1991, this artificial reef-related fishing generated angler expenditures of $127.7 million per year.

These benefits and opportunities, however, did not simply occur overnight. Rather, it has been through the combined efforts of a strong constituency of recreational anglers and divers, and dedicated state, interstate, and federal resource agencies that have made artificial reef development and management in the coastal United States a reality. Although artificial reef development has occurred since the early 1960s, it was not until the passage of the National Fishing Enhancement Act of 1984 that artificial reefs became formally recognized as an important component of marine fisheries conservation and management.

Specifically, the Act stated that artificial reefs, when properly designed, constructed and located, can, among other things, enhance the habitat and diversity of fishery resources, increase user opportunities (both recreational and commercial), and contribute to the national and coastal economies. Further, the Act authorized the Department of Commerce's National Oceanic and Atmospheric Administration to develop a National Artificial Reef Plan and gave the Department of the Army's U.S. Army Corps of Engineers regulatory responsibility to implement the Act.

Soon after passage of the Act, the National Artificial Reef Plan was developed and approved. This Plan has served as the center-piece around which all marine artificial reef development, management and research activities have revolved. In less than eight years since the Plan's development, 19 out of 23 coastal states have active artificial reef programs. Twelve out of the 19 states have, or are in the process of developing, state-wide artificial reef plans. Each plan is specific to the needs of the individual coastal states, based on the guidelines and requirements outlined in the National Plan. Fundamental to each state program and plan is the goal that artificial reefs be used to enhance and conserve fishery resources, facilitate use, minimize conflicts and risks, while limiting the effects of fishing pressure on over-exploited stocks.

In addition to their individual efforts, states have played a very active role in the formulation of regional artificial reef policies and initiatives through the auspices of the Atlantic States Marine Fisheries Commission's Artificial Reef Committee and the Gulf States Marine Fisheries Commission's Recreational Fisheries Management Subcommittee. Through their respective committees, both Commissions, with the help of the ARDC, have developed comprehensive, region-wide databases. These databases, housed in total with the ARDC, document the current status of state artificial reef development, research and management activities along the east and Gulf coasts.

Specifically, the databases describe each state's artificial reef program and contain detailed quantitative information on over

670 permitted artificial reef sites. The compliation of this information has proved to be vital, for it has enabled state and regional artificial reef managers to view artificial reef development and management activities in the United States in their entirety. A much clearer picture has been gained on the enormity and importance of artificial reefs to the nation, including the recent Rigs-to-Reefs program in the Gulf. More importantly, these databases have given state and regional artificial reef managers a strong foundation upon which future region-wide artificial reef initiatives can be planned and developed. As a result, artificial reef development no longer occurs in the piece-meal fashion it once did. Through the combined efforts of state, interstate and national managers, it now moves forward in a well-thoughtout and coordinated manner.

The Rigs-to-Reefs Program is just one example of such a coordinated effort. Through the program, managers have worked to retain an already valuable habitat in the Gulf by formally converting obsolete petroleum platforms into artificial reefs. It is important to note, however, that the Rigs-to-Reefs program it just one component of the region's overall artificial reef activities. It serves a valuable purpose but only because it is within the context of an overall, well-designed, larger national artificial reef program.

Thank you for the opportunity to express the views of the Sport Fishing Institute. I would be happy to answer any of your questions and provide additional information as needed.

Texas Artificial Reef Program Fact Sheet

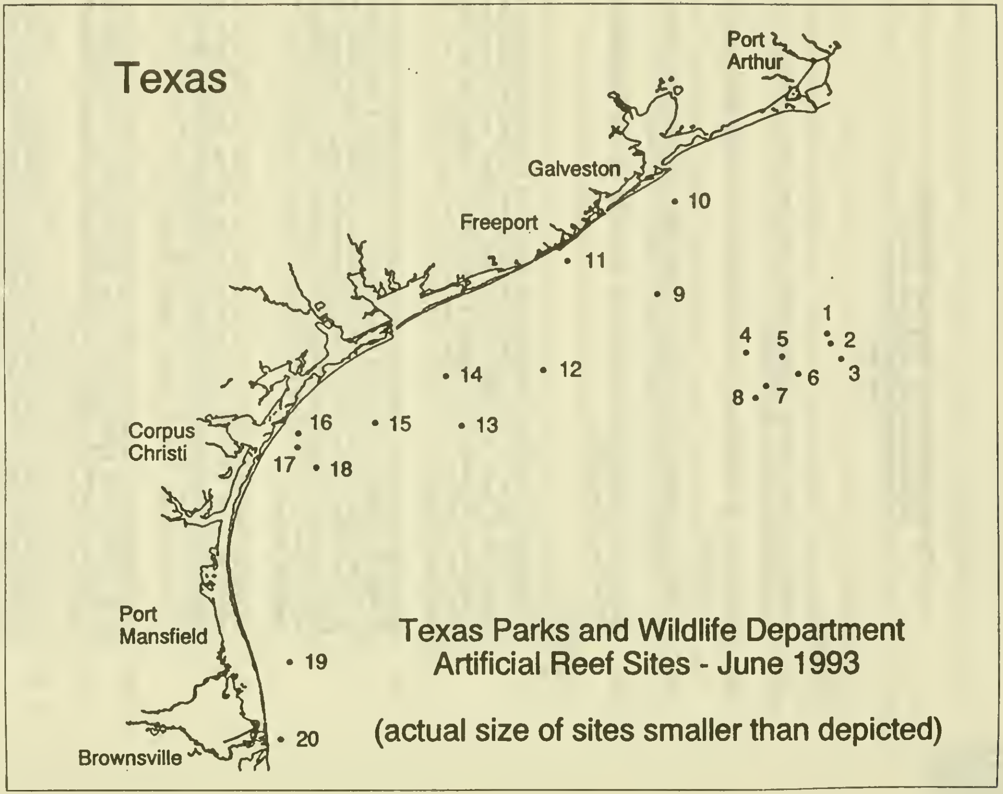
Hal Osburn, Artificial Reef Program Director
Texas Parks and Wildlife Department
June 1993

GOALS

- Enhance and protect marine fisheries and the environment that sustains all reef-associated species in the Gulf of Mexico.
- Facilitate use of artificial reefs for commercial and recreational fishing and for sport diving.
- Minimize environmental risks and risks to public health and property by using the best scientific information available to select materials and sites.
- Comply with international maritime law and avoid creating unreasonable obstructions to navigation.

BENEFITS

- Environmental -- Establishes hard substrates upon which new marine ecosystems can develop. Barnacles, corals, sponges and other small sea creatures attach to artificial reefs (such as toppled oil rigs) and this gives rise to new reef communities that sustain red snapper, grouper and other species of reef fish, which face increasing pressure from commercial and sport fishing as well as shrimp trawl bycatch.
- Social and Economic -- Enhanced coastal tourism and economic development through new undersea sport diving and fishing sites. Texas has a large number of licensed divers, yet has few quality diving sites. Saltwater sport fishing in Texas, including deep sea fishing, produces an economic impact of more that $2 billion per year for the economy of the state. Impacts on the offshore shrimp industry have been minimal since artificial reef sites cover less than 0.1 % of the trawlable bottom.
- Oil and Gas Savings -- For the purpose of marine conservation, the Rig To Reefs component of the Artificial Reef Program involves oil and gas producers in funding projects that benefit Gulf fisheries. For oil and gas companies, Rigs To Reefs represents a way to avoid the high costs of dismantling and removing Gulf rigs, which already serve as de facto artificial reefs.
- Long-Term Vision -- Department staff envision that one day, with enough money in the Artificial Reef Fund, they can create undersea parks. Visitors could be ferried out on hovercrafts and taken down in bathyspheres to view the "aquarium without walls" created by artificial reefs.
- Achievements To Date -- Since passage of the Texas Artificial Reef Act in 1989, the program has taken responsibility for 20 artificial reef sites involving 17 former drilling rigs and 12 former Liberty Ships. The program has generated $2.5 million for the Texas Artificial Reef Fund.



Texas Parks and Wildlife Department
Artificial Reef Sites - June 1993

(actual size of sites smaller than depicted)

TEXAS PARKS & WILDLIFE
ARTIFICIAL REEF PROGRAM
Site Location List

Reef Site Number	Description of Reef Material	Location/ Distance Offshore	Water Depth
1	3 Oil Rig Jackets Clustered	89 Miles Offshore Sabine Pass/ Port Arthur	185 feet
2	2 Oil Rig Jackets Clustered	91 Miles Offshore Sabine Pass/near Port Arthur	192 feet
3	1 Oil Rig Jacket	99 Miles Offshore Sabine Pass/near Port Arthur	214 feet
4	1 Oil Rig Jacket	77 Miles Offshore Sabine Pass/near Port Arthur	170 feet
5	1 Oil Rig Jacket	90 Miles Offshore Sabine Pass/near Port Arthur	195 feet
6	1 Oil Rig Jacket	95 Miles Offshore Sabine Pass/near Port Arthur	238 feet
7	1 Oil Rig Jacket W/Deck	94 Miles Offshore Sabine Pass/near Port Arthur	230 feet
8	1 Oil Rig Jacket	110 Miles Offshore Sabine Pass/near Port Arthur	288 feet
9	3 Vessels 1 Welded Pipe-Reef	45 Miles Offshore Galveston	105 feet
10	Concrete/Clay Pipes	11.5 Miles Offshore Galveston	57 feet
11	1 Vessel	9 Miles Offshore Freeport	45 feet
12	2 Oil Rig Jackets Clustered	48 Miles Offshore Freeport	150 feet
13	1 Oil Rig Jacket	43 Miles Offshore Port O'Connor	204 feet

TEXAS PARKS & WILDLIFE
ARTIFICIAL REEF PROGRAM
Site Location List

Reef Site Number	Description of Reef Material	Location/ Distance Offshore	Water Depth
14	1 Vessel	25 Miles Offshore Port O'Connor	108 feet
15	1 Oil Rig Deck	27 Miles Offshore Aransas Pass/near Corpus Christi	130 feet
16	Concrete Culverts	6 Miles Offshore Aransas Pass/near Corpus Christi	60 feet
17	1 Vessel	10 Miles Offshore Aransas Pass/near Corpus Christi	72 feet
18	3 Vessels	18 Miles Offshore Aransas Pass/near Corpus Christi	110 feet
19	3 Vessels 2 Oil Rig Jackets Clustered	15 Miles Offshore Port Mansfield	101 feet
20	1 Vessel	4 Miles Offshore Port Isabel/near Brownsville	72 feet

Texas Artificial Reef Fishery Management Plan

by

C. Dianne Stephan
Brett G. Dansby
Hal R. Osburn
Gary C. Matlock
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Fishery Management Plan Series
Number 3

Texas Parks and Wildlife Department
Coastal Fisheries Branch
4200 Smith School Road
Austin, Texas 78744

EXECUTIVE SUMMARY

Artificial reefs can be used with other fishery management techniques designed to achieve optimum yield from fisheries. The Texas legislature recognized this potential with the passage of the Artificial Reef Act of 1989, which directed the Texas Parks and Wildlife Department (Department) to promote, develop, maintain, monitor, and enhance the artificial reef potential in state waters and federal waters adjacent to Texas. The act defined an artificial reef as a structure or system of structures constructed, placed, or permitted in the navigable water of Texas or water of the federal exclusive economic zone adjacent to Texas for the purpose of enhancing fishery resources and commercial and recreational fishing opportunities. Enhancement of fishery resources is considered to be the restoration or creation of habitat to improve recruitment and spawning potential of reef associated species, while enhancement of fishing opportunities is the creation or improvement of fishing opportunities. To fulfill these purposes, the Department was directed to develop a state artificial reef plan in accordance with Chapter 89 of the Texas Parks and Wildlife code.

The Artificial Reef Act of 1989 provided guidance for planning and developing artificial reefs in a cost effective manner to minimize conflicts and environmental risks.

The Texas Artificial Reef Plan is a product of a process designed to maximize the input of those interest groups most affected by the placement of artificial reefs in salt waters. The Plan has been reviewed by the Texas Artificial Reef Advisory Committee, created to advise and make recommendations to the Department on details and specifications of the plan, in accordance with Chapter 89 of Texas Parks and Wildlife Code. Meetings with Department staff and the Committee were held in January, May, August, and October of 1990. These meetings were also open to and attended by members of the public and other state officials. Meetings were recorded and transcripts are available upon request.

All comments received were carefully considered. As directed by the Legislature, the Committee consisted of a representative of each of the following: (1) salt water sports fishing organization, (2) offshore oil and gas company, (3) Texas tourist industry, (4) General Land Office, (5) shrimping organization, (6) Texas diving club, (7) Attorney General's Office, (8) Texas university, and (9) environmental group.

The Artificial Reef Act of 1989 provided guidance for planning and developing artificial reefs in a cost effective manner to minimize conflicts and environmental risks. As directed by the legislature, an artificial reef covered under this Plan must be sited, constructed, maintained, monitored, and managed in a manner that:

(1) enhances and conserves fishery resources to the maximum extent practicable;

(2) facilitates access and use by Texas recreational and commercial fishermen;

(3) minimizes conflicts among competing uses of water and water resources;

(4) minimizes environmental risks and risks to personal and public health and property;

(5) is consistent with generally accepted principles of international law and national fishing law and does not create any unreasonable obstruction to navigation;

(6) uses the best scientific information available; and

(7) conforms to the state artificial reef plan.

Recommendations which have been developed in the Artificial Reef Plan to guide the Department's artificial reef program include the following:

- The Department should be made a permitting agency for artificial reef development in Texas and the adjacent Exclusive Economic Zone, with authority to deny any permit for proposed artificial reef construction which does not conform to the Texas Artificial Reef Plan.
- Subsequent to the adoption of the Artificial Reef Plan, an advisory committee consisting of persons from groups with interest in artificial reefs should be selected by the Chairman of the Texas Parks and Wildlife Commission for the purpose of advising the Department on implementation of the Plan.
- The specific locations for artificial reef development should be within the priority areas identified in the Plan.
- Artificial reefs should be constructed as benthic reefs using ships, oil platforms, or similarly constructed materials arranged in as complex a fashion as possible without jeopardizing structural integrity, and oriented in a fashion which maximizes effectiveness, durability and stability.
- The Department should actively pursue acquiring offshore platforms for use as artificial reefs in the Gulf of Mexico, in deference to other structures.
- The cost of the Department's artificial reef development, maintenance, and marking program should not exceed revenues accumulated in the Artificial Reef Fund. The cost of creating and maintaining artificial reefs

should be borne by the donor; however, the Department should minimize these costs to the maximum extent possible.

- The Artificial Reef Fund should be the sole source of funds for costs to the Department associated with artificial reefs. Any donation of artificial reef material should be accompanied by at least 50% of the realized savings to the donor. Costs associated with donation of an artificial reef should be included when calculating potential savings.
- Existing oil and gas platforms located in the priority areas for artificial reef development should be deployed as artificial reefs as near their current location and in a form as close to their current form as possible.
- Oil and gas platforms located within excluded areas at the time of removal should be placed as near as possible to artificial reefs located in priority areas.
- The specific location for materials not already present within the priority areas should be at sites that maximize enhancement of fishery resources and opportunities for recreational and commercial fishing to achieve optimum yield, minimize impacts on other users of the water column, and minimize environmental, property and health risks.
- The liability incurred by the Department through any donations of artificial reef material should be minimized to the maximum extent possible.
- The Department should continue to work with other groups to coordinate artificial reef development and management.
- Fishery resource harvest from artificial reefs should be regulated to satisfy fishery management objectives of the regulating entities within Texas and the adjacent Exclusive Economic Zone.
- The Department's present monitoring program should be enhanced to meet legislative mandates and to continue to determine trends in population abundance and stability, movement, growth, mortality and the impacts of environmental influences on reef associated species.
- The Department's present monitoring program should be enhanced to meet legislative mandates and to continue to determine fishery harvest trends, economics and impacts of sociological influences.
- Continued assessment and evaluation of the Department's activities by the Texas Parks and Wildlife Commission are necessary to meet legislative mandates and to address data needs reviewed in this Plan.
- The Department should continue to maintain a high level of interdepartmental and interagency communication to more fully benefit from the free flow of information concerning artificial reef research, adverse environmental conditions and changes in economic and societal goals.
- The Department should take advantage of the opportunities afforded by the creation of artificial reefs for scientific study and education of the public, including recreational spectators (e.g., nonconsumptive divers).

Implementation of the Texas Artificial Reef Plan should insure the continued enhancement of fishery resources and fishing opportunities for future Texans. By doing so, many other Texans and visitors to Texas will benefit directly and indirectly.

INTRODUCTION

Artificial reefs are any structures placed by man in the environment which alter the natural habitat. As such, artificial reefs represent a tool by which man can elicit changes in the ecosystem to achieve benefits. In general, the benefits sought through the use of artificial reefs have been the enhancement of fishery resources with a concomitant increase in fishing opportunities. As with any tool, however, artificial reefs can be used inappropriately, leading to detrimental effects such as loss of more valuable habitat, overfishing and destruction of property. Comprehensive planning strategies for the siting, deployment, maintenance, and management of artificial reefs is needed to maximize their assets, minimize their liabilities, and achieve desired purposes.

Artificial reefs represent a tool by which man can elicit changes in the ecosystem to achieve benefits.

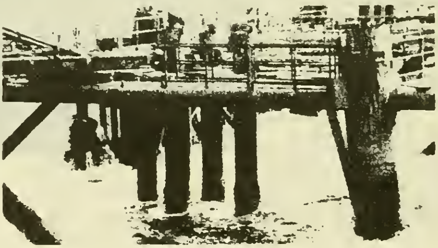
Artificial reefs can be used with other fishery management techniques designed to achieve optimum yield from fisheries. The Texas Legislature recognized this potential with the passage of the Artificial Reef Act of 1989. The act defined an artificial reef as a structure or system of structures constructed, placed, or permitted in the navigable water of Texas or water of the Federal Exclusive Economic Zone adjacent to Texas for the purpose of enhancing fishery resources and commercial and recreational fishing opportunities. The Act provided guidance for planning and developing artificial reefs in a cost effective manner to minimize conflicts and environmental risks. The Texas Parks and Wildlife Department (Department) was directed to develop an artificial reef plan (Plan) which meets these purposes, including the promotion, development, maintenance, monitoring and enhancement of the artificial reef potential in Texas and the adjacent Federal Fisheries Conservation Zone.

The Department manages the fisheries of the state to achieve optimum yield. For purposes of the Plan, optimum yield is defined as the amount of resources that the fisheries will produce on a continuing basis to achieve the maximum economic benefits to the fishing industries and the state as modified by any relevant social or ecological factors. Stated simply, fisheries should be managed by the State in a way that does not differ significantly from the way they would be managed by a privately-owned firm. This approach is consistent with that taken by the state in its management of other natural resources and the United States government in managing its natural resources, including fisheries.

Historical Perspective

Artificial reefs have been used for centuries to make fish available to fishermen. It is unclear how often this objective has been achieved, but other impacts have inevitably resulted from man's placement of structures and rigid materials in the aquatic environment. For example, the indiscriminate dumping of various materials of opportunity in the Gulf of Mexico (Gulf) has led to interference with navigation, expensive marking, and sites inaccessible to anglers. The specific goals to be achieved with artificial reef placement have seldom been clearly defined, leading to conflicts among competing interests as well as inefficient use of man-power and money. Further, artificial reefs have been created both intentionally and unintentionally. For example, jetties used to maintain navigational channels have also enhanced fishing opportunities. The United States (U.S.) Congress, recognizing the need for comprehensive planning to guide future artificial reef development in the U.S., passed the National Fishing Enhancement Act of 1984. That legislation mandated the development of a National Artificial Reef Plan.

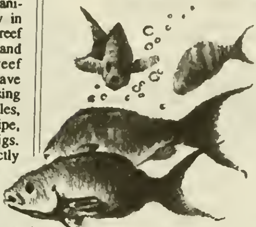
Further impetus for the development of the National Artificial Reef Plan stemmed from the requirement by the U.S. Department of Interior that offshore oil and gas platforms must be removed completely when they are no longer producing and that the sea floor must be restored to its original condition. The use of offshore platforms for artificial reef development can be a practical and economically attractive alternative to platform dismantling. The Gulf now has over



4,000 oil and gas platforms in State and Federal waters with forty percent of these offshore structures slated for removal by the year 2000. The removal of these structures will destroy the artificial reefs they represent, will be extremely expensive, and will preclude taking advantage of them in creating additional reefs. Indeed, "the size, shape, design, profile and density and openness of petroleum structures make them the most durable reusable material readily available for permanent artificial reef construction (1988 Interim Report of the Texas Legislature's Subcommittee on Rigs-to-Reefs)." With this in mind, the Department of the Interior paved the way for a movement toward a national Rigs-to-Reefs Programs.

A host of states have carried forward this Federal initiative for a rigs-to-reefs program. In the Gulf, where offshore platforms are most prevalent, each of the bordering states has an artificial reef development program. Louisiana has an approved plan which facilitates the conversion of obsolete offshore platforms into artificial reefs. There have been at least 10 pre-planned rigs-to-reefs projects completed in the Gulf including one off Texas. This experience has stimulated new removal techniques and cost-saving technologies favoring reef development as a preferred disposal option.

Texas has been involved in artificial reef placement since the late 1940's. The Department has been authorized to conduct an artificial reef development program (Section 12.016, Parks and Wildlife Code) and Department staff have worked cooperatively with other state agencies, sport fishery and conservation organizations, and private industry in siting; obtaining permits and reef material; building, placing and maintaining reefs and reef markers. Artificial reefs have been created intentionally using oyster shell, tires, automobiles, construction rubble, clay pipe, barges, ships and drilling rigs. The Department has been directly involved in the construction of 23 artificial reefs. The largest initiative for artificial reefs in Texas occurred during the mid-1970's when 12 obsolete Liberty ships were sunk. Three each were placed off Freeport, Matagorda, Port Aransas, and South Padre Island. The most recent artificial reef constructed was an offshore platform donated to the Department by Transco and deployed about 80 miles southeast of Galveston in January 1990. Reefs constructed from ships and offshore platforms have generally had much greater longevity than other materials used.



These intentionally-created artificial reefs are far exceeded by the over 2,000 de facto artificial reefs that exist in the form of piers, docks, jetties, and petroleum platforms in salt water in and adjacent to Texas. These structures perform the same function as any artificial reef, including enhancing fishery resources and commercial and recreational fishing opportunities, even though they may not have been built for that purpose.

The vast majority of unintentional artificial reefs are located in inland waters and coastal bays. The area benefitting least from decades of de facto artificial reef development has been the offshore saltwater zone. It was the needs of this area that the Texas Artificial Reef Act of 1989 apparently sought to address. Legislatively identified groups to be represented on the Artificial Reef Advisory Committee, created by the Act, reflect the emphasis placed on this area. Representatives of a saltwater sports fishing organization, an offshore oil and gas company, and a shrimping organization are included, but freshwater fishing interests and inshore oil and gas companies are not represented. Therefore, the Texas Artificial Reef Plan will focus on artificial reef development in the Gulf of Mexico off Texas unless otherwise noted.

Goal and Objectives for the Artificial Reef Plan

In 1989, the Seventy-first Texas Legislature directed the Department to promote, develop, maintain, monitor, and enhance the artificial reef potential in state waters and federal waters adjacent to Texas to enhance fishery resources and commercial and recreational fishing opportunities. Enhancement of fishery resources is considered to be the restoration or creation of habitat to improve recruitment and spawning potential of reef associated species. If this goal is achieved, fishermen will not be the only beneficiaries. Divers engaged in recreational spectating will also benefit from increased access to additional reef structure and the ecological communities that result. To fulfill this purpose, the Department was directed to develop a state artificial reef plan in accordance with Chapter 89 of the Texas Parks and Wildlife Code. An advisory committee was created to advise and make recommendations to the Department on details and specifications of the Plan.

The Texas Artificial Reef Plan is a product of a process designed to maximize the input of those interest groups most affected by the placement of artificial reefs in salt waters. The Plan has been reviewed by the Texas Artificial Reef Advisory Committee. Meetings with Department staff and the Committee were held in January, May, August, and October of 1990. These meetings were also open to and attended by members of the public and other state officials. Meetings were recorded and transcripts are available upon request. All comments received were carefully considered. As directed by the Legislature, the Committee consisted of a representative of each of the following: (1) salt water sports fishing organization, (2) offshore oil and gas company, (3) Texas tourist industry, (4) General Land Office, (5) shrimping organization, (6) Texas diving club, (7) Attorney General's Office, (8) Texas university, and (9) environmental group.

The Plan is also a product of a process designed to gather and use the best scientific information available. This process included the contracting of Texas A&M University in 1988 to review all of the available scientific information concerning artificial reefs and prepare a report on artificial reefs. A synthesis of all applicable scientific research on which the Plan is based is contained in the Texas Artificial Reef Plan Source Document. It, too, has been reviewed by the Texas Artificial Reef Advisory Committee. Items required by the legislature that can be found in the Plan include:

- operational guidelines for the plan, including specific participant roles, and projected funding requirements for the plan;
- geographic, hydrographic, geological, biological, ecological, social, economic, and other criteria for permitting and siting artificial reefs;
- design, materials, and other criteria for establishing, constructing, and maintaining artificial reefs;
- mechanisms and methodologies for monitoring artificial reefs in compliance with the requirements of permits issued under the National Fishing Enhancement Act;

- mechanisms and methodologies for managing the use of artificial reefs;
- a map that depicts priority areas for artificial reef development consistent with the act and the National Fishing Enhancement Act; and
- provisions for managing the artificial reef fund in a manner that will assure successful implementation of the plan.

As directed by the legislature, an artificial reef covered under this Plan must be sited, constructed, maintained, monitored, and managed in a manner that:

- enhances and conserves fishery resources to the maximum extent practicable;
- facilitates access and use by Texas recreational and commercial fishermen;
- minimizes conflicts among competing uses of water and water resources;
- minimizes environmental risks and risks to personal and public health and property;
- is consistent with generally accepted principles of international law and national fishing law and does not create any unreasonable obstruction to navigation;
- uses the best scientific information available; and
- conforms to the state artificial plan.

Insomuch as the legislature desired that the Texas Artificial Reef Plan be consistent with the National Fishing Enhancement Act, the Plan and Source Document reference the National Artificial Reef Plan extensively.

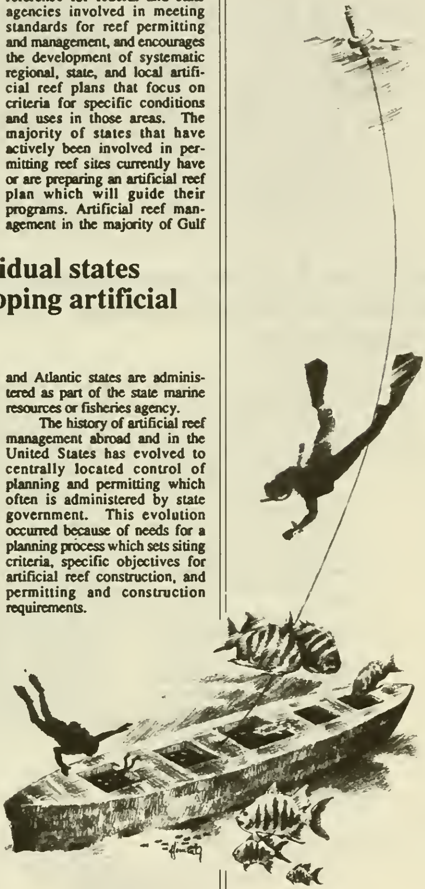
ARTIFICIAL REEF PROGRAMS AND PLANS

Artificial reefs have been constructed outside the United States for centuries. The United States and individual states have also been involved in developing artificial reefs for over 100 years. Abroad and overseas artificial reef planning has moved toward a more integrated program of research and development for resources enhancement, conservation, and management in order to attain both short and long term goals.

In the United States, national concern for artificial reef planning and management developed with the enactment of the National Fishing Enhancement Act of 1984. This legislation stressed the need for responsible and effective artificial reef development in United States waters, and mandated the development of the National Artificial Reef Plan. The National Artificial Reef Plan is a flexible working document designed to serve as a starting point for effective artificial reef development. Specifically the plan provides guidance on technical aspects of artificial reef development and management, serves as a technical reference for federal and state agencies involved in meeting standards for reef permitting and management, and encourages the development of systematic regional, state, and local artificial reef plans that focus on criteria for specific conditions and uses in those areas. The majority of states that have actively been involved in permitting reef sites currently have or are preparing an artificial reef plan which will guide their programs. Artificial reef management in the majority of Gulf and Atlantic states are administered as part of the state marine resources or fisheries agency.

The history of artificial reef management abroad and in the United States has evolved to centrally located control of planning and permitting which often is administered by state government. This evolution occurred because of needs for a planning process which sets siting criteria, specific objectives for artificial reef construction, and permitting and construction requirements.

The United States and individual states have been involved in developing artificial reefs for over 100 years.



USE OF ARTIFICIAL REEFS TO ENHANCE FISHERY RESOURCES

Artificial reefs can be used to enhance reef fish and other organisms which comprise reef communities. However, artificial reef development displaces or otherwise impacts adjacent communities. Thus, it is important to define clearly the purpose of each proposed reef. For purposes of this document, an artificial reef is defined as a structure or system of structures constructed, placed or permitted in the Texas Territorial Sea and adjacent Exclusive Economic Zone waters for the purpose of enhancing fishery resources and commercial and recreational fishing opportunities. Enhancement of fishery resources is defined as an increase in the number of juveniles (recruits) and spawning potential per recruit. Oil and gas platforms, although not specifically constructed for fishery enhancement, serve this function; and the communities which develop are excellent examples of the communities and subsequent ecological interactions which occur on artificial reefs.

Offshore platforms in the Gulf of Mexico enhance fisheries by providing attachment substrate for habitat limited sessile invertebrates such as barnacles, oysters, mussels, bryozoans, hydroids, sponges, and corals. In addition to resident species, artificial reefs attract transient species, which may be present at a reef for periods of a few hours to a few days. Artificial reefs attract a variety of resident fish species. These species may be trophically dependent upon the sessile and motile invertebrates associated with a reef, attracted for cover and structure provided by the reef, or attracted as transient predators which feed on resident species.

As outlined above, artificial reefs have the ability to enhance reef associated assemblages. However, increases in the number of juveniles and spawning potential per recruit of reef associated species has not been documented for any artificial reef. Marine fishery professionals working with artificial reefs are well aware of the need for in depth ecological studies of the effects of artificial reefs on reef associated species, as well as the effects of artificial reefs on adjacent communities. For example, an increase in populations of trophically independent reef fish species such as red snapper must have some effect on the population of their prey species such as shrimp, which are also economically important. These questions must be addressed in order for fishery managers to understand the entire function of artificial reefs in fishery enhancement.

Artificial reefs can be used to enhance reef fish and other organisms which comprise reef communities.

USE OF ARTIFICIAL REEFS TO ENHANCE FISHERY OPPORTUNITIES

Artificial reefs can enhance the fishing opportunities for hook and line or spear fishermen targeting fish associated with the artificial reef. However, fishing opportunities for some other types of fishermen may be reduced. Opportunity is defined as an appropriate or favorable time or occasion. While not defined in the authorization statute for the artificial reef plan, the term "fishing opportunities" used herein means an appropriate or favorable fishing time or occasion. By definition, artificial reefs are structures that are placed by man in areas to enhance fishing opportunities. Enhancement of fishing opportunities through artificial reefs can occur by increasing the number or surface area of artificial reefs, increasing the accessibility of the sites to the fishermen, and ultimately increasing the potential for success of harvesting the desired species.

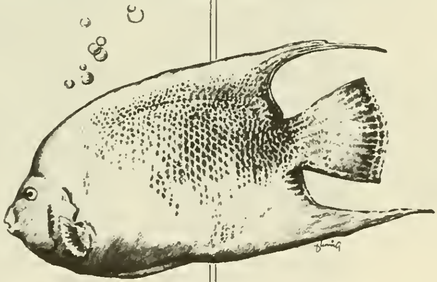
By definition, artificial reefs are structures that are placed by man in areas to enhance fishing opportunities.

Approximately 50-60% of the recreational fishermen operating in the Gulf off Texas used artificial reefs including oil and gas platforms for an estimated total of 300,000-400,000 anglers. Private sport boat saltwater fishermen on average took over 4 trips per year to the Gulf and spent over $100 per trip during the 1987-1988 and 1988-1989.

Partyboats (10 or fewer anglers) and headboats (more than 10 anglers) also operate in the Gulf of Mexico. Of the estimated 128 partyboats in Texas, 54% fished in the offshore area in 1987, while 86% of the 12 headboats in Texas fished offshore. During 1977-1978, 57% of interviewed offshore partyboat operators made at least one trip to an artificial reef and/or oil platform; 12% of all offshore partyboat trips to an artificial reef or oil platform were to a liberty ship site, and 23% were to an oil platform. In the South Padre Island/Port Isabel area, only 7% of partyboat trips were to artificial reefs. On average, partyboat reef users travel further offshore than non-reef users.

The species most often sought or landed by private sportboat anglers fishing in the Gulf include king mackerel, Spanish mackerel, cobia, red snapper, sand seatrout, silver seatrout, Atlantic spadefish, dolphin, vermilion snapper, Atlantic sharpnose shark, sheepshead, greater amberjack, and southern flounder. The mean annual private-boat landings in the Gulf (1982-1987) was dominated by sand seatrout (36,000 pounds), red snapper (35,000 pounds) and king mackerel (21,000 pounds).

A total of 782 Commercial Finfish Fishermen Licenses were sold in 1988, but only about 50 of these fishermen fished for fish in the Gulf. In Texas, snapper were the primary reef associated fish species landed by commercial fishermen with an average of nearly 600,000 pounds landed annually. Grouper were the second most dominant species landed with an average of over 200,000 pounds landed annually. Hook and line is the fishing gear most frequently used to harvest reef-fish. The use of longlines in the Gulf reef fish fishery began in 1980. Most recently, longlines account for 8% of red snapper harvest in the Gulf of Mexico, 34% of grouper harvest, and 24% of the total harvest of reef fish species landed. Other reef associated species landed commercially include grouper, greater amberjack, sheepshead, cobia, king mackerel, bluefish, dolphin, crevalle jack, Spanish mackerel, gray triggerfish and Atlantic spadefish.



SITING OF ARTIFICIAL REEFS

By Texas law, artificial reefs must be sited in a manner that enhances and conserves fishery resources, enhances fishing opportunities by recreational and commercial fishermen, minimizes conflicts among water users, minimizes environmental risks and risks to personal and public health and property, does not create any unreasonable obstruction to navigation and is consistent with generally accepted principles of international and national laws. Therefore, all these concerns must be taken into consideration when determining the location of prospective artificial reef development. Geographic, social, economic and environmental concerns have been incorporated into a resource planning framework developed by the Sport Fishing Institute, that can help in siting reefs designated for the enhancement of recreational fisheries. This framework can be modified to include the provisions mandated by the Parks and Wildlife Code (Chapter 89).

Three basic steps are included in the Sport Fishing Institute's framework for identification of artificial reef sites. The first is to identify the fishing zone designated for development using geographic, social, economic, and environmental information. For Texas, that area is defined by Chapter 89 of the Parks and Wildlife Code as the navigable water of Texas and water or the federal fisheries conservation zone adjacent to Texas waters. The second step, exclusion mapping, identifies and excludes areas within the fishing zone which should not be used for artificial reef development because of existing legislative or regulatory prohibitions, and potential user conflicts. In the final step, areas within the fishing zone that have specific positive attributes for artificial reef development are delineated and targeted for reef development. Areas within exclusion zones which were designated because of potential user conflicts may also be targeted for siting if those areas are already avoided by the traditional users. The following sections detail applicable criteria for the development of artificial reefs in Texas marine waters.

Areas within the fishing zone that have specific positive attributes for artificial reef development are delineated and targeted for reef development.

Parks and Wildlife Code, Chapter 89, requires that the National Artificial Reef Plan be followed as a guide and reference in the development of the Texas Artificial Reef Plan. The national plan gives general guidelines and some specific criteria for siting. For example, exclusion areas for artificial reefs to enhance fishing resources should include, but need not be limited to, shipping lanes, existing "live bottom" areas, restricted military areas, areas of poor water quality (e.g., hypoxic zones, sewage outfalls, toxic chemical dumps), traditional trawling grounds, unstable bottoms, existing rights-of-way (e.g., oil and gas pipelines and telecommunication cables), and sites used for other purposes which are incompatible with artificial reef development.

Parks and Wildlife Code, Chapter 89, further requires that a map be developed that depicts priority areas for artificial reef development consistent with the provisions of the Chapter and the National Fishing Enhancement Act. The technique described above and the criteria that follow were used to construct the required map (Figure 1). Specifically, the unshaded priority areas were identified by excluding existing fairways, clay and/or silt bottom substrate, historical shipwrecks, coral reefs, live bottom areas, oil and gas pipelines, industrial waste sites, and any other areas that might have safety considerations.

Geographic Criteria

Shipping fairways, anchorage areas, and historical shipwrecks should be avoided when siting artificial reefs. Shipping fairways and anchorages off Texas are critical to shipping commerce, and are non-negotiable for excluding as areas for artificial reef development. Historical shipwrecks may not be disturbed within the Texas Territorial Sea unless permitting has been acquired from the Texas Antiquities Committee.

Geographic areas which may be targeted for artificial reef construction because of obstructions in existence include all artificial reefs currently in place off the Texas coast. Permits for four of the five Liberty ship sites have allowed for the addition of petroleum platforms to those sites.

Hydrographic Criteria

The primary hydrographic factors to be considered in site selection include waves, water depth, currents, tides and water quality (Stone 1985). It has been suggested that since hydrographic effects are difficult to predict, the reef planners should anticipate the maximum effects possible, and compensate with appropriate reef shapes, composition, and siting prior to deployment to insure that the reef is not damaged, displaced or silted over.

The scientific literature provides little guidance for setting strict and discerning hydrographic criteria, thus a conservative

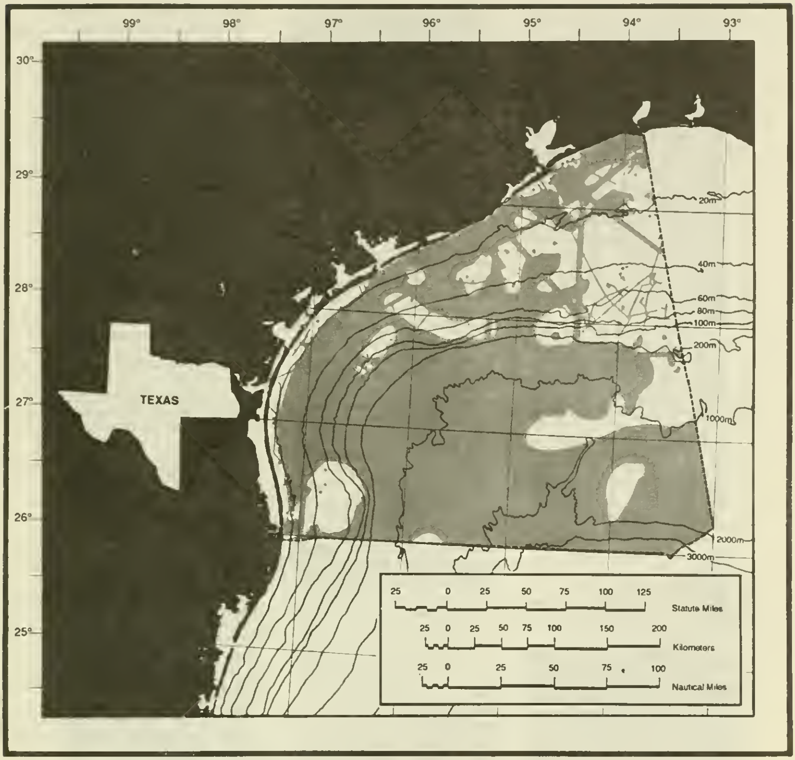


Figure 1.
Map of priority areas (unshaded) for artificial reef development in the Gulf of Mexico off Texas. Dashed line indicates boundary of water area covered by Plan.

approach should be taken under the general guidelines given in the literature. Reef stability depends on water depth and wave conditions. Water movement generated by currents or tides may affect siltation, material displacement, light penetration, and the fishability of the reef site. Water out to the 33 foot isobath is generally more turbid than beyond 33 feet due to the mixing of bottom sediments caused by wave interaction. Currents off the Texas-Louisiana continental shelf coastal region are primarily driven by longshore windstress. Water circulation associated with currents is dynamic, and each proposed reef site should be evaluated extensively for prevailing current patterns.

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Substrate composition and sedimentation are the two primary geological considerations for artificial reef siting. Locations with a hard rock or hardpan bottom and a thin covering of sand or silt are highly recommended in the national plan; however, hard packed sand, gravel or shell are also acceptable, especially for placement of low density material such as fiberglass, plastic or rubber. Soft sediments such as clays, silts, and loosely packed sands should be avoided.

Bottom compositions range from sand and silt to hardpacked sand at nearshore locations, with an increase in sand content towards the mouth of the Rio Grande River, and an increase in mud content with movement offshore. Soft-sediments of unconsolidated clay or silt sized particles tend to silt over, subside, or degenerate from the abrasive effects of water born particles and current or wave action.

Biological Criteria

Artificial reef development may be either beneficial or detrimental to marine organisms in the affected area. Species which have been targeted for artificial reef development should be benefited, although literature regarding increases in actual production by artificial reef development for reef associated species is inconclusive. Determination of applicable biological considerations must be based upon the proposed purpose for artificial reef development, which dictates the species to be targeted. Siting criteria must be evaluated for each species or species groups, and include determination of species range and habitat requirements. In addition, existing and proposed fishery management plans and regulations for the targeted species must also be evaluated, as artificial reefs must be used to accomplish fishery management goals.

Ecological Criteria

Quantitative literature on the enhancement of fisheries with artificial reefs is vague; however, general ecosystem concepts lead to the conclusion that use of an artificial environment to modify food webs in an ecosystem will lead to both positive and negative changes in that ecosystem. For example, species adapted to a soft or sand bottom environment may be displaced by the construction of an artificial reef in that area. Therefore, the ecological benefits of artificial reef production must be weighed for all life stages of affected organisms on a species by species basis. Areas already high in biological productivity are not potential artificial reef sites according to the national plan. Examples of these types of habitat include live bottom areas, oyster reefs, coral reefs, beds of aquatic grasses or macroalgae, and scallop, mussel or clam beds. Live bottom areas are defined as marine areas supporting dense growth of sponges, sea fans, corals, and other sessile invertebrates generally associates with rock outcrops. Live bottom areas off of Texas are concentrated at depths greater than 197 feet. In the Gulf off Texas there are areas high in biological productivity other than those previously listed. These other areas support extensive infaunal and demersal stocks characterized principally by shrimp and groundfish communities which would be affected by the placement of artificial reefs. These communities are located primarily within depths less than 328 feet.

[illegible]

Social concerns of artificial reef development focus on the safe utility of the proposed artificial reef to the targeted user group. The Parks and Wildlife Code mandates that recreational and commercial fishermen are to be targeted as user groups for artificial reef development in Texas. Thus, safety concerns, along with the utility of the reef to recreational and commercial fishermen must be considered. Artificial reefs cannot be placed within 1640 feet around oil production platforms or 774 feet around pipelines, nor in prohibited areas and danger zones designated by the U. S. Department of Defense. Polluted areas and area affected by treated sewage effluent should also be avoided to minimize resource exposure and risks to public health.

Additional social factors which must be evaluated when planning the location of an artificial reef include the amount of land based infrastructure available to support the activities of a user group in an area, the accessibility of the proposed reef to the identified user group, and the ability of the proposed site to attract the species targeted. The gulf area within 30 miles of Aransas Pass, Galveston, Freeport, Port Mansfield, and Brazos Santiago Pass serve the largest and broadest constituency of fishermen. The gulf access sites most utilized by party boat anglers seeking fish typically associated with reefs (e.g., snapper, grouper, mackerel) are Galveston, Freeport, Aransas Pass, and Brazos Santiago Pass.

User conflict at artificial reef sites in Texas was not identified as a problem in Texas waters; however, potential user conflicts may increase with the potential increase in artificial reef development. Since the primary purpose of this plan is to enhance fisheries, the siting of reefs must consider the impacts on all Texas fisheries. A reef that may enhance the reef fishery might adversely impact the shrimp or menhaden fisheries. The shrimp trawling industry opposes artificial reef development in these productive areas because of the potential damage to equipment, but advocates the development of artificial reefs in areas historically avoided because of bottom obstructions or snags.

Economic Criteria

The costs associated with building, siting, maintaining, and managing artificial reefs in addition to opportunity costs of utilizing the water column for a reef should be weighed against benefits which will be derived from the reef. Opportunity costs represent costs to other user groups that are excluded because of the creation of the reef. Siting should consider all of the aspects aforementioned as they all are affected by the location and primary use of the reef.

Artificial reef development may be partitioned into six phases, each of which may require funding: 1) acquisition of reef material, 2) preparation of reef materials for deployment, 3) transportation and deployment of reef materials, 4) buoy purchase, 5) buoy maintenance, and 6) evaluation studies. Administrative costs are common to all six phases. Because many aspects of state artificial reef programs are interdependent, and may be integrated with other state programs, it is difficult to interpret funding of these programs, and even more difficult to partition funding into development phases. However, by considering the significant activities associated with each phase, approximate costs can be estimated.

The benefits or positive economic effects provided by artificial reefs include enhanced fishing opportunities for commercial and recreational fishermen, as well as the "non-use" benefits that are not related to immediate harvesting of the fishery stocks. Projected benefits can be compared to the costs of siting and maintaining the reef in specific locations.

Funding

Support for artificial reef development may take the form of money, material, or labor, and may be donated by private or governmental agencies, granted by federal, state, or local governments, provided in mitigation activities, or raised by the salvage of donated materials. Siting of artificial reefs is usually associated with the type and amount of funding available. In Texas, the Legislature has mandated that funding come from sources other than state general revenue funds. However, county and local governments may provide support for artificial reef development. Bonus revenues from the sale of salvageable reef materials, and mitigation have also been used to fund artificial reef development.

Liability

Liability is an important issue in artificial reef development and management, and may be incurred at all stages of the project, including permitting, siting, transportation, deployment, and maintenance. Section 205 of the National Fishing Enhancement Act mandates that proof of financial ability to assume liability must be presented to the Corps of Engineers by the permit applicant before a permit for artificial reef construction may be issued. As a result of this requirement, many artificial reef programs are administered by state agencies which hold all required permits for artificial reef development. Even so, potential liability for injuries, loss, or damage resulting from construction or maintenance of an artificial reef may involve numerous parties, and will be decided based upon the National Fishing Enhancement Act, Parks and Wildlife Code, federal admiralty law, and/or state tort law. The State of Texas, however, does not assume ownership (and liability) until the rigs are properly placed on the ocean floor. Specifically, the Department and its agents must be directed not to accept liability for, and it is not within the course and scope of their employment to accept liability for, incidents arising out of the dismantling, transportation, or placement of donated oil rigs.

All future donation agreements must absolve the State of Texas from liability for incidents arising out of the dismantling, transportation, and placement of the rigs and must designate the donor oil company, or a third party, as liable for all claims arising prior to the rigs being placed correctly on the ocean floor.

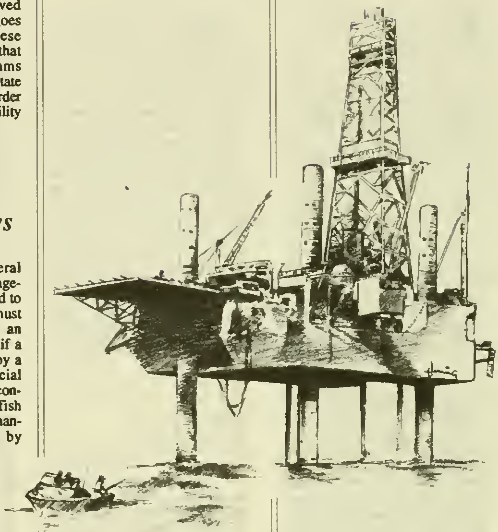
These provisions ensure that a future state official unaware of the liability dangers associated with dismantle and transportation will not inadvertently allow the state to be made the insurer for what is potentially the most dangerous phase of the project. The donation agreement for the Transco rig-to-reef project in early 1990 fulfills these requirements. It is essential that future donation agreements track the language of this agreement.

The Texas Tort Claims Act (Art. 6252-19) defines the liability of state government and state agencies in Texas. Sovereign immunity is eliminated in Section 4, but liability is limited in Section 3 to $250,000 per person, $500,000 for any single occurrence of bodily injury or death, and $100,000 for any single occurrence of injury to or loss of personal property.

Liability concerns have been addressed by administrators of state artificial reef programs on the Gulf and Atlantic coasts. Some administrators feel comfortable with their protection under the National Fishing Enhancement Act, providing conditions of the permit are closely adhered to. Other administrators are quite concerned about liability, and each has tried to obtain a ruling from their state attorney general's office. In most cases, the ruling has not been of assistance, and it is felt that the ambiguity concerns about liability will not be resolved until a relevant suit undergoes litigation. However, these administrators recommend that state artificial reef programs should be reviewed with the state attorney general's office in order to clarify the program's liability exposure.

State and Federal Laws

Other State and Federal regulations and fishery management plans which are designed to protect or enhance species must be considered when siting an artificial reef. For example, if a targeted species is managed by a minimum size limit, artificial reefs that congregate large concentrations of undersized fish may compromise a fishery management plan's objective by increasing fishing mortality.



PERMITTING

The creation of artificial reefs changes some aspect of an existing environment. Society, through its government, has required that before those changes can occur, the possible impacts must be evaluated through several permitting agencies. Before construction may begin on an artificial reef project in United States navigable waters, permits must be obtained from two federal agencies, the Corps of Engineers, and Coast Guard. In addition, a third permit from the Environmental Protection Agency may be necessary if materials are considered, by the Environmental Protection Agency, to be in violation of water quality standards. Each agencies' authority is highly decentralized, with regional decision making capabilities. Moreover, each permit is evaluated on a case-by-case basis within a region, and evaluation of permit requests are directly subject to interpretation by regional personnel.

Artificial reefs proposed for construction in Texas waters are also subject to permit requirements by three state agencies: the Texas General Land Office, the Texas Water Commission and the Texas Antiquities Committee. Procedures for permit application to the Texas Water Commission are initiated by the Corps of Engineers upon receipt of a Corps of Engineers application. Permit applications for the required coastal easement lease from the Texas General Land Office are the applicant's responsibility. The Antiquities Committee is empowered to protect landmarks and thus may review applications for siting of reefs and may require a permit if a landmark might be affected.

Possible impacts must be evaluated through several permitting agencies.

CRITERIA FOR ESTABLISHING, CONSTRUCTING AND MAINTAINING ARTIFICIAL REEFS

Material and design selection for an artificial reef should be based upon the overall purpose for artificial reef development. The purpose of artificial reefs in Texas is to enhance fisheries resources and commercial and recreational fishing opportunities for Texans. The efficacy of specific materials and designs can be evaluated on the basis of four standards, including function, compatibility, durability and stability, and availability. Evaluation of specific materials and designs using these standards may be accomplished regardless of the location of development.

The efficacy of specific materials and designs can be evaluated on the basis of four standards, including function, compatibility, durability and stability, and availability.

Design

The available scientific evidence is inconclusive on the best designs to enhance any species or species groups. However, available information indicates that certain designs do affect the number of fish and species types attracted to an artificial reef. Artificial reefs can be characterized as either benthic reefs or fish aggregating devices; each of these groups can be further characterized, based upon height in the water column. Low profile benthic reefs have a reef height to water depth (aspect ratio) of less than 1/3, while high profile benthic reefs have an aspect ratio of greater than 1/3. High profile benthic reefs are thought to be more versatile than low profile reefs, since they have the potential to harbor a greater species diversity. However, conflicting reports exist concerning the importance of height to artificial reef design. Fish aggregating devises are moored structures which are either suspended in mid-water between surface and bottom, or float at the surface. Fish aggregating devises are designed to attract and temporarily hold fish, which are most often pelagic species.

Researchers disagree regarding the importance of vertical relief to artificial reef effective- The steepness of the sides of a reef may actually be more important than reef height, however, the basis for this conclusion is not known. Enhancement of fisheries resources is correlated with the structural complexity of reefs. Reefs constructed perpendicular to general prevailing currents additionally increase water flow; however, the placement of reefs perpendicular to prevailing currents in areas of exceptionally strong currents and/or storm surges may result in reef displacement.

Materials

Materials used for artificial reef construction are classified as either materials of opportunity or prefabricated materials. Materials of opportunity include natural materials such as stone rubble, brush or trees, and surplus or damaged material such as concrete, derelict vessels, scrapped vehicles, tires, or oil platforms. Eighty percent of the reefs recorded in the Sport Fishing Institute's 'Reef Profiles' database are constructed of materials of opportunity. The most commonly used materials of opportunity are obsolete vessels, surplus concrete, tires, and various types of stone rubble. In addition, the availability of obsolete oil and gas platforms or rigs, which provided impetus for the Louisiana Artificial Reef Initiative promises to be important in future artificial reef development in the Gulf of Mexico. The available scientific information on the best materials to enhance any species or species groups is limited; however, some substances are better than others at obtaining desired effects. Moreover, stability and durability of artificial reefs depend on the type of material used.

Marking requirements, regulations and specifications regarding marking artificial reefs in the Gulf are stated in the policy statement 'Eighth U. S. Coast Guard District Policy For Marking Artificial Fishing Reefs In The Gulf Of Mexico', available from the Eighth District Commander and outlined below.

Depth (mean low tide): Type of buoy(s) required if the clearance from the water surface to the top of the reef is:

a. less than 85 feet – yellow special purpose buoy(s) with a flashing six second yellow light;
b. 85 to 200 feet – unlighted yellow special purpose buoy(s);
c. 200 feet or more – markings not required.

Size: Number of buoys required if the longest side of the reef is:

a. less than 1/2 nautical mile – one buoy positioned in the center of the reef;
b. 1/2 to 1 nautical mile – one buoy positioned at each corner of the reef;

c. over 1 nautical mile – one buoy set on each corner of the reef and additional buoys positioned on the reef's perimeter at 1 nautical mile intervals or as directed by the District Commander.

Location: If the reef is located within 1500 feet of a fairway, channel or anchorage area, a quick flashing (red or green) buoy between the edge of the reef and the navigational area is also required.

Waivers may be granted for the lighted buoy requirements on reefs with over 50 feet of water clearance provided:

a. the reef is over 2 nautical miles from fairways, channels or anchorage;

b. there is no history of deep draft traffic in the area;

c. the entire reef complex is adequately marked.

Waivers may also be granted for the marking requirement on reefs with over 85 feet of water clearance provided:

a. the reef is included on updated National Ocean Service navigational charts;

b. the reef is over 2 nautical miles from fairways, channels or anchorage;

c. there is no history of deep draft traffic in the area.

MECHANISMS AND METHODOLOGIES FOR MANAGEMENT

Texas legislators have delegated some authority to manage the fishery resources of Texas to the Texas Parks and Wildlife Commission, which is appointed by the Governor and approved by the Senate. The Texas Parks and Wildlife Commission establishes policy for the Department and adopts regulations. The Department administers the Commission's management programs, enforces statutes and regulations, conducts research and provides information and recommendations to the Commission, Legislature and Governor. The Department was granted authority to regulate the harvest of all wildlife resources, except shrimp and oysters, in all counties via the Wildlife Conservation Act of 1983 (Chapter 61, Parks and Wildlife Code), and has additional authority in certain other counties via Title 7 (Local and Special Laws) of the Parks and Wildlife Code. Authority to regulate shrimp and oyster harvest was provided in 1985 through amendments to Chapters 76 and 77, Parks and Wildlife Code. In addition, through Chapter 79 (Parks and Wildlife Code, Extended Fishery Jurisdiction), the Department is authorized to cooperate with the Gulf of Mexico Fishery Management Council for management of fishery resources in waters of the Gulf beyond state waters.

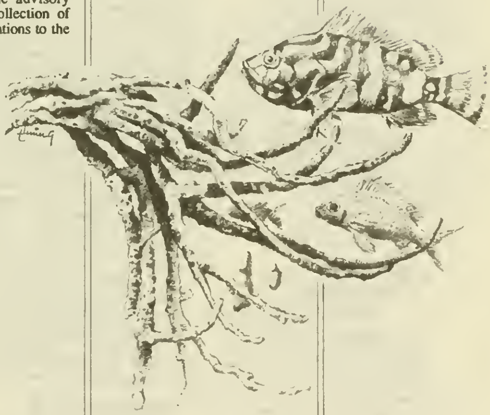
There needs to be increased attention on the questions regarding the impacts of artificial reefs on fish populations and fisheries.

The Department's mission is to prevent depletion and waste of wildlife resources while maximizing the opportunity for harvest by regulating the means, methods, manners, and places in which it is lawful to take or possess wildlife resources. This mission parallels the goals of the Texas Artificial Reef Plan which calls for the enhancement of fishery resources and commercial and recreational fishing opportunities. To achieve this goal, the Department is mandated to; plan and review permit applications for artificial reefs; coordinate with relevant state and federal agencies; hold public hearings on proposed artificial reefs; oversee the maintenance and placement requirements of artificial reefs; and, develop rules and guidelines, in conjunction with the advisory committee, in the collection of fees, grants, and donations to the artificial reef fund. The twin goals of enhancing the resource as well as fishing opportunities may not necessarily compliment each other when the establishment of an artificial reef results in increased fishing mortality. Both commercial and recreational fishermen will concentrate their fishing efforts at artificial reefs when they target reef community species. High fishing mortality on an artificial reef can lead to overfishing, as witnessed on artificial reefs off South Carolina. Once fishing mortality exceeds the production of biomass attributed to enhancement by an artificial reef, there is a net loss in fishery resources. Although the biological attributes of artificial reefs have been verified in a number of observational studies, there are still only limited scientific studies relating to the management of artificial reefs. Few studies used quantitative experimental methods and many lacked scientifically valid controls. The importance of fish attraction versus fish production and the relationship between standing crop and fish catch have not been adequately addressed. Thus, as reef programs move forward, there needs to be increased attention on the questions regarding the impacts of artificial reefs on fish populations and fisheries, not just development of more reef sites. The debate among artificial reef authorities continues to center around the question of whether reefs actually increase predatory fish biomass or merely concentrate the already existing biomass. If artificial reefs merely attract fish then the placement of more of these structures could be detrimental in areas where fish stocks are already overfished. For example, red snapper in the Gulf are currently being over-fished. Management efforts that concentrate the species and thereby increase its vulnerability to fishing pressure may serve to harm the population further.

MANAGEMENT OF THE ARTIFICIAL REEF FUND

The Legislature has created a fund designed to allow the Department to carry out artificial reef plan management independent of any other legislative funds or appropriations. Specifically, subchapter C, Section 89.041 of the Parks and Wildlife Code directs; (a) that the artificial reef fund be created in the State Treasury, (b) the fund be composed of all funds received by the state, including interest and earnings on the funds, and (c) no state general revenue funds shall be expended in the development or implementation of this plan. Additionally, Section 89.002(b)(5) of Parks and Wildlife Code directs the Department to develop rules and guidelines, in conjunction with the advisory committee, in the collection of fees, grants, and donations to the artificial reef fund.

The Legislature has created a fund designed to allow the Department to carry out artificial reef plan management.



CURRENT ACTIONS AND RECOMMENDATIONS

Permitting Authority

The legislature mandated the Texas Parks and Wildlife Department to promote, develop, maintain, monitor, and enhance the artificial reef potential in Texas waters and the Exclusive Economic Zone adjacent to Texas waters. Currently, the Department performs these functions by obtaining permits for artificial reef sites from other state and federal agencies, and by commenting upon permit applications submitted by other artificial reef builders to other state and federal agencies. Although the Department's comments are taken into consideration by the permitting agency, the Department does not have the authority to deny a permit when the goals of artificial reef construction proposed by another party conflict with the Departmental goals outlined in Chapter 89 of Texas Parks and Wildlife Code.

RECOMMENDATIONS

> The Department should be made a permitting agency for artificial reef development in Texas and the adjacent Exclusive Economic Zone, with authority to deny any permit for proposed artificial reef construction which does not conform to the Texas Artificial Reef Plan.

Artificial Reef Advisory Committee

As the specifics of this Plan are implemented following the adoption by the Texas Parks and Wildlife Commission of rules and regulations, it is vital to have the continued input of all individuals and groups interested in artificial reefs and associated resources of Texas. Upon completion of this Artificial Reef Plan, which includes rules and guidelines governing the creation and management of the Artificial Reef Fund, the duties of the Artificial Reef Advisory Committee will be complete and its authorization will terminate.

RECOMMENDATIONS

> Subsequent to the adoption of the Artificial Reef Plan, an advisory committee consisting of persons from groups with interest in artificial reefs should be selected by the Chairman of the Texas Parks and Wildlife Commission for the purpose of advising the Department on implementation of the Plan.

Map of Priority Areas For Artificial Reef Development

Chapter 89, Parks and Wildlife Code, requires that the Plan include a map depicting priority areas for artificial reef development. An exclusion mapping process was used to generate a map of priority areas for artificial reef development. During this process, all areas which have been designated as unsuitable for artificial reef development by the best scientific information available or by the National Artificial Reef Plan were identified, using appropriate geographic, hydrographic, geological, biological, ecological, social and economic criteria. These areas were then plotted on a map of waters covered by the Plan, and designated as areas to be initially excluded for artificial reef development. The remaining areas are designated priority are as for artificial reef development.

RECOMMENDATIONS

> The specific locations for artificial reef development should be within the priority areas depicted in Figure 1.

Materials and Design

Benthic reefs are designed to enhance habitat for bottom dwelling organisms, whereas fish aggregating devices serve only to attract and temporarily hold pelagic fish species. Thus, benthic reefs serve all aspects of the Department's goal for artificial reef development, including the enhancement of fishery resources and opportunities for recreational and commercial fishing; however, fish aggregating devices serve only to enhance fishing opportunities. The National Artificial Reef Plan calls for artificial reef materials to be highly durable and stable to prevent displacement or breakup of the reef. The more complex the material or arrangement of the material comprising an artificial reef, the greater the number of chambers, openings and interstitial spaces. A moderate to high level of complexity is most beneficial for artificial reef success.

RECOMMENDATIONS

> Artificial reefs should be constructed as benthic reefs using ships, oil platforms, or similarly constructed materials arranged in as complex a fashion as possible without jeopardizing structural integrity, and oriented in a fashion which maximizes effectiveness, durability and stability.

Acquisition of Reef Materials

A great deal of materials of opportunity which can be used for artificial reef construction are available. Offshore platforms presently located in the Gulf of Mexico are already fabricated and serving as artificial reefs. Offshore platforms are available at an increasing rate for use in artificial reef development programs. Their construction is consistent with recommendations concerning materials and design, and their donation as artificial reefs to state agencies willing to assume the associated liability make them attractive from a cost efficiency standpoint.

RECOMMENDATIONS

The Department should actively pursue acquiring offshore platforms for use as artificial reefs in the Gulf of Mexico, in deference to other structures.

Funding of Reef Development and Maintenance

With the assistance of the Artificial Reef Advisory Committee, the Department has been directed to develop rules and guidelines for the establishment and management of an artificial reef fund. The legislature has required the Department's artificial reef program to be self-sustaining. With the construction of artificial reefs come costs associated with administration, deployment, maintenance (any action necessary to ensure continuous compliance with all artificial reef permit requirements) and marking. Therefore, as the donor benefits from the construction of an artificial reef with his donated material, he should be responsible for costs associated with its construction and management.

RECOMMENDATIONS

(a) The cost of the Department's artificial reef development, maintenance, and marking program should not exceed revenues accumulated in the Artificial Reef Fund.

(b) The cost of creating and maintaining and marking artificial reefs should be borne by the donor; however, the Department should minimize these costs to the maximum extent possible.

Funding of Additional Program Needs

Beyond the costs associated with the maintenance of artificial reefs come potential costs of liability. Once ownership of the materials on an artificial reef site is transferred to the Department, liability costs may be incurred for which state funds are insufficient or otherwise not available. In addition, numerous research needs associated with artificial reef development have been identified, such as determination of the best monitoring methods and best materials, designs, and locations for determining and subsequently maximizing the enhancement capabilities of artificial reefs. Currently, dedicated funding for these investigations is not available. As the donation of materials by an entity may result in substantial savings over alternative methods of material disposal, funding for artificial reef research projects and additional program needs should be offset by the savings accrued to the material donors.

RECOMMENDATIONS

(a) The Artificial Reef Fund should be the sole source of funding for costs to the Department associated with artificial reefs.

(b) Any donation of artificial reef material should be accompanied by a payment of at least 50% of the realized savings to the donor. Costs associated with donation of an artificial reef (under recommendation 6b) should be included when calculating potential savings.

Siting of Platforms Indigenous to Priority Areas

Existing oil and gas platforms serve as artificial reefs while still in use. These structures are stable and effective at supporting fish and invertebrate assemblages common to natural reef habitats. By minimizing movement and alteration of existing oil and gas platforms, artificial reef deployment costs as well as disturbance of the existing assemblages of organisms are minimized.

RECOMMENDATIONS

Existing oil and gas platforms located in the priority areas for artificial reef development should be deployed as artificial reefs as near their current location and in a form as close to their current form as possible.

Siting of Platforms Exogenous to Priority Areas

Use of existing permitted Department artificial reef sites for deployment of additional material ensures that new materials are located in areas already familiar to commercial and recreational fishermen as artificial reef sites. In addition, commercial shrimpers are historically aware of these sites as areas to avoid while trawling.

RECOMMENDATIONS

Offshore platforms located within excluded areas at the time of removal should be placed as near as possible to artificial reefs located in priority areas.

Siting of Other Materials Exogenous to Priority Areas

The Department is mandated to develop artificial reefs to enhance fishery resources and fishing opportunities, while minimizing conflicts among users, and minimizing environmental, property, and health risks. The exclusion mapping process has designated priority areas for artificial reef development. Once these areas are identified, the final step in the exclusion mapping process of artificial reef siting includes the designation of areas which will provide as little conflict among users of the water column as possible. Examples of these areas include historical obstructions to trawling and previously constructed artificial reefs.

RECOMMENDATIONS

The specific location for materials not already present within the priority areas should be at sites that maximize enhancement of fishery resources and opportunities for recreational and commercial fishing to achieve optimum yield, minimize impacts on other users of the water column, and minimize environmental, property and health risks.

Liability

Liability may be incurred at all phases of artificial reef development, including permitting, siting, construction, and maintenance. Both the United States Congress and the Texas legislature, through the National Fishing Enhancement Act, and Chapter 89, Parks and Wildlife Code, respectively, sought to limit liability during artificial reef development. However, the success of these statutory efforts has yet to be tested in court.

RECOMMENDATIONS

The liability incurred by the Department through any donations of artificial reef material should be minimized to the maximum extent possible.

Joint Management

The Department is responsible for developing artificial reefs in the Texas Territorial Sea and adjacent Exclusive Economic Zone to enhance fishery resources and fishing opportunities. The Department is also responsible for the management of fish stocks and related research in the Texas Territorial Sea, and in conjunction with the National Marine Fisheries Service and Gulf of Mexico Fishery Management Council is responsible for fishery research and management in the Exclusive Economic Zone. Cooperation among these entities is mandatory for successful management of common fishery resources. This coordinated effort can provide for more effective development and management of artificial reefs and associated fishery resources.

RECOMMENDATIONS

The Department should continue to work with other groups to coordinate artificial reef development and management.

Regulation of Fishery Resource Harvest

The National Artificial Reef Plan directs artificial reef developers and managers to consider the objectives of fishery management entities involved in regulating organisms influenced by artificial reefs. For example, if a targeted species is managed by a minimum size limit, artificial reefs should not be constructed to aggregate large concentrations of undersized fish, or should facilitate maximum survival of released fish.

RECOMMENDATIONS

Fishery resource harvest from artificial reefs should be regulated to satisfy fishery management objectives of the regulating entities within Texas and the adjacent Exclusive Economic Zone.

Fishery Independent Monitoring

The objectives of fishery independent monitoring performed by the Department are to develop long-term trend information on fish population abundance and stability in Texas bays and offshore waters, and to monitor environmental conditions which may influence these factors. A monitoring program provides information about most life history stages of the resource and is capable of detecting changes in population structure.

RECOMMENDATIONS

The Department's present monitoring program should be enhanced to meet legislative mandates and to continue to determine trends in population abundance and stability, movement, growth, mortality and the impacts of environmental influences on reef associated species.

Fishery Dependent Monitoring

The objectives of fishery dependent monitoring programs are to determine size, catch per unit effort and value of reef associated species landed by commercial and recreational fishermen from Texas bays and offshore waters, and to determine monthly and annual purchases of edible seafood products by commercial dealers through Monthly Marine Products Reports. Daylight commercial landings and fishing activities are estimated from on-site surveys at seafood dealers, boat access sites and commercial vessel docking structures. The landings and fishing activities of sport fishermen are monitored through on-site surveys at recreational boat access sites.

RECOMMENDATIONS

The Department's present monitoring program should be enhanced to meet legislative mandates and to continue to determine fishery harvest trends, economics and impacts of sociological influences.

Assessment and Evaluation

The Department is mandated (Sections 12.001, 61.051, and 89.021, Parks and Wildlife Code) to annually assess and publish the status of marine organisms of the state's saltwater fisheries and associated environmental variables. The Department is also responsible for making management recommendations regarding the state's fisheries.

RECOMMENDATIONS

Continued assessment and periodic evaluation of the Department's activities by the Texas Parks and Wildlife Commission are necessary to meet legislative mandates and to address data needs reviewed in this Plan.

Communication, Research, and Education

The Department is required to report on findings of fishery research, assessments and evaluations and to make recommendations for further actions when studies indicate they are appropriate to accomplish the objectives of this Plan.

The creation of artificial reefs provides valuable research opportunities. Many questions regarding the productivity, general ecology, and use of artificial reefs by fishermen and recreational spectators remain unanswered. New artificial reefs will provide educational opportunities, allowing for the study of reef communities.

RECOMMENDATIONS

(a) The Department should continue to maintain a high level of interdepartmental and interagency communication to more fully benefit from the free flow of information concerning artificial reef research, adverse environmental conditions and changes in economic and societal goals.

(b) The Department should take advantage of the opportunities afforded by the creation of artificial reefs for scientific study and education of the public, including recreational spectators (e.g., nonconsumptive divers).

The Texas Parks and Wildlife Department will periodically update data and information contained within the Texas Artificial Reef Plan.

~ *NOTES* ~

Texas Agricultural Extension Service
The Texas A&M University System
P. O. Box 158
Port Aransas, Tx
78373
(512) 749-5207
Sea Grant College Program
Marine Advisory Service

June 18, 1993

Honorable Solomon Ortiz
Chairman Subcommittee on Oceanography
Gulf of Mexico and Outer Continental Shelf
U.S. House of Representatives
Subcommittee on Oceanography
H2-575
Gerald Ford House Office Building
Washington, D.C. 20515

Dear Congressman Ortiz,

I would submit the following information as written testimony to the subcommittee for the hearing on "offshore oil and gas operations site clearance and rig disposal."

By conservative estimate two thousand oil and gas production platforms in the Gulf of Mexico are scheduled for removal by the turn of the century. The cost of construction and installation of each platform ranges from five to thirty million dollars, while removal costs range from one to five million - depending on platform size and location. In most instances there is virtually no salvage value.

While these structures are highly regarded as prime fishing locations by both recreational and commercial fishermen and are utilized extensively by SCUBA divers, legislation stipulates that they be physically removed following completion of production in a given field. Oil companies have complied with this stipulation not only because of the legal requirement, but also to relieve themselves of the liability of a non-producing platform (i.e. vessel collision, navigation aids and platform maintenance, etc.).

One alternative to dismantling and removing platforms to shore based disposal has been the "artificial reef program." Similar programs have been instituted by most Gulf coast states whereby platforms are toppled and either left in place or towed to a designated reef site and sunk. While this program has the potential to make use of certain platforms designated for removal, it has limitations based on platform location relative to enhanced fishery production as well as creating bottom obstructions which interfere with the Gulf shrimp fishery.

A major domestic oil company initiated a project three years ago to assess the technological and economic feasibility of utilizing offshore production platforms (both active and inactive) as a base of operations for production of indigenous Gulf finfish in net pens surrounding the platform. Should the project prove economically feasible production of finfish in the Gulf could help ease

The Texas A&M University System, U.S. Department of Agriculture, and the County Commissioners Courts of Texas Cooperating

the current three billion dollar annual deficit the U.S. experiences in edible fishery products, while providing continued employment for oil company personnel who will be laid off as production ceases and platforms are removed.

The economic goal of this project is to produce sufficient finfish at each platform to make it a profit center. The positive aspects of the project include 1) the availability of existing structures built to withstand the harsh environment of the Gulf of Mexico, 2) superb water quality which will allow production of highly marketable indigenous marine species which cannot be produced at most coastal aquaculture facilities (eg. various species of snappers & groupers, dolphinfish, pompano, etc.), 3) elimination of the threat of "winter-kill" of cold sensitive species as currently experienced by aquaculturists utilizing shallow coastal ponds. (Elimination is due to the "heat sink" effect of the Gulf of Mexico), 4) virtual elimination of the potential for "pollution" of the receiving water via fish farm effluent, a concern also currently being experienced by land based aquaculturists. Negative aspects of the project include the relatively high cost of operating a facility offshore vs. onshore and the technological development of various net pen systems which are durable but cost effective.

Based on three years of research at three different platform sites in the Gulf of Mexico, the oil company feels as though the project has potential to be profitable - not only for their company but the various other operators in the Gulf as well. However, the company has invested more than three million dollars in the project to date, and we're still developing net pen systems uniquely suited to each platform site. I say "we" since I've been acting as a technical advisor to them on this project in my role as fishery specialist with the TAEX and Sea Grant programs at Texas A&M.

Current activities include evaluation of two unique net pen designs at a platform only seven miles offshore of Corpus Christi. This particular platform was acquired by the Texas General Land Office (GLO) specifically for this project due to their interest in developing offshore net pen aquaculture. The oil company leases the platform from the GLO. The company has recently approved funding for two graduate assistants from Texas A&M - Corpus Christi to conduct research associated with the project in partial fulfillment of their graduate degrees. Should you need further information please give me a call.

Sincerely,

Russell J. Miget

Russell J. Miget
Evironmental Quality Specialist

RJM/lgh

cc: Wilbur Johnson
President MNE, Inc.

LOUISIANA'S ARTIFICIAL REEF PROGRAM

Subcommittee on Oceanography
Gulf of Mexico and Outer Continental Shelf

June 29, 1993

This country's most extensive artificial reef system exists off the coast of Louisiana. This system consists of the 4,000 oil and gas platforms in the Gulf of Mexico, 90% of which are located off the coast of Louisiana. Fishermen of Louisiana and bordering states have long recognized the fishing value of oil and gas structures. Surveys indicate that over 75% of all recreational offshore fishing trips originating in Louisiana have as their destination oil and gas structures.

Since these platforms are so commonplace off the Louisiana coast, many citizens and management groups believe that these structures are permanent and will always be available for fishing. However, this is not the case. It has been estimated that 640 structures have already been removed from coastal Louisiana and by the year 2000 over 40% of the remaining oil and gas structures in the Gulf of Mexico will have been removed.

The State of Louisiana recognized this potential loss of habitat and the need to develop a plan to offset some of the inevitable loss of hard substrate habitat.

In 1985, the Louisiana Artificial Reef Initiative (LARI) involving state, federal, university, and industry representatives began the development of an artificial reef program for Louisiana. Under the guidance of LARI, the Louisiana Artificial Reef Plan was prepared and legislation (Louisiana Fishing Enhancement Act) creating the Louisiana Artificial Reef Program implemented in 1986.

The Louisiana Artificial Reef Plan contains the rationale and guidelines for implementation and maintenance of a state artificial reef program. It is intended to serve as a flexible working document which will be periodically updated -- through the Louisiana Artificial Reef Council -- based on the results of operation.

The Artificial Reef Plan was implemented under the leadership of the Louisiana Department of Wildlife and Fisheries.

The Artificial Reef Council is composed of three entities; the Louisiana Department of Wildlife and Fisheries, the Louisiana Sea Grant, and the Center for Coastal Energy and Environmental Resources Louisiana State University (CCEER). As stated in the Louisiana Fishing Enhancement Act, the Department of Wildlife and Fisheries administers and enforces the program. The Department of Wildlife and Fisheries plans and reviews permit applications with advice from CCEER and the Sea Grant. The Department of Wildlife and Fisheries coordinates activities with relevant state and federal agencies, oversees the maintenance and placement requirements of artificial reefs, and develops additional technical information needed to carry out the program. The Department is also responsible for promoting public awareness of the program by cooperating with sportsman's groups and the media, by publishing reef maps, and conducting other public information activities.

The Center for Coastal, Energy and Environmental Studies provides technical support to the Department for program development. The Center is now in the process of developing a biological monitoring program to help evaluate existing artificial reefs and improve those for future development.

Acceptance of materials for use as artificial reefs is determined on a case by case basis by the consensus of the Louisiana Artificial Reef Council. Although oil and gas structures are the most abundant materials of opportunity, they are not the only materials that can be used.

Following the lengthy process of site selection, eight artificial reef planning areas were delineated off the Louisiana coast. These eight areas were presented at public hearings in Chalmette, Houma, and Lake Charles and discussed with representatives of the shrimp industry in Lafitte and Galiano. Based on public comment, a ninth area was added and the locations of the other areas modified slightly to accommodate concerns by the user groups. The nine areas comprise Phase I of Louisiana's Artificial Reef Program (Figure 1). These are areas which were determined to be compatible with artificial reef development. The rationale for Planning Areas was to include input from individual user groups in the development of proposed areas for reef development.

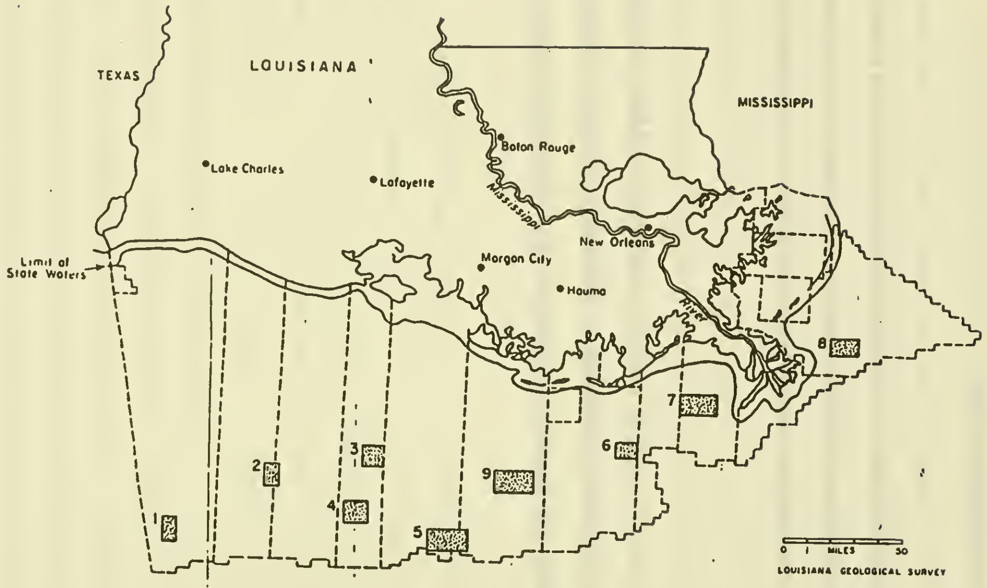
The establishment of artificial reef complexes within each reef planning area are based upon the best available information regarding bottom type, currents, bathymetry, and other factors affecting performance and productivity of the reefs. Precise design and location of the reef complex will also be dependent upon the physical dimensions of the donated materials. Since Louisiana has shallow continental shelf, Program managers targeted areas with 100 feet of water or greater when utilizing oil and gas platforms. As the program develops low profile materials will be considered closer to shore. Again as with the offshore program, the various user groups, particularly the shrimping industry, will be consulted to help in site selection in an effort minimize impacting their operations.

Permitting guidelines for artificial reefs were outlined in the National Artificial Reef Plan and are summarized in the state plan. The U.S. Army Corps of Engineers (COE) is the primary agency for permitting the establishment of an artificial reef. The state must file an application with the COE and the COE will notify other federal and state agencies about the application. In addition to filing for a Corp of Engineers Artificial Reef permit, the state must acquire a permit authorizing the use of aids to navigation from the U.S. Coast Guard. Depending on the location and depth of water, different types of buoys may be required. The Louisiana Department of Natural Resources Coastal Zone Management Division is responsible for permitting activities in the coastal zone of Louisiana and is also responsible for consistency with activities in federal waters. The Department of Natural Resources reviews artificial reef permit applications to determine their consistency with the state's coastal zone management plan.

Currently the State maintains 12 artificial reef sites utilizing the jackets of 26 platforms. These sites range from 28 to 120 miles from shore. It is anticipated an additional five sites utilizing approximately sixteen platforms will be deployed by the end of 1993.

Louisiana is in the enviable position of having over 3,500 artificial reefs currently functioning adjacent to its coastline. Through this Program, Louisiana can maintain a portion of this important fisheries habitat for future generations.

Offshore Louisiana Artificial Reef Planning Area



1 West Cameron Planning Area
2 East Cameron Planning Area
3. South Marsh Island (76) Planning Area
4. South Marsh Island (146) Planning Area
5 Eugene Island Planning Area
6. South Timballer Planning Area
7. West Delta Planning Area
8. Main Pass Planning Area
9. Ship Shoal Planning Area

FIGURE 1

publications and what is happening on the research front.

To assist individuals and groups planning to construct a reef for recreational fishing, the ARDC has published a planning guide which provides step-by-step approach to reef construction, stressing the need for careful planning prior to placement of the reef and proper follow-up studies after reef deployment.

As a further means of reaching the public, the Director of the ARDC often addresses workshops and conferences, providing a national perspective on artificial reef development in the United States.

PUBLICATIONS

ARDC Technical Reports	Price
Permitting Procedures for Artificial Reefs	$6.00
Artificial Reef Maintenance	$6.00
Liability Concerns in Artificial Reef Materials	$6.00
Transportation Costs of Artificial Reef Materials	$6.00
Economic Valuation of Artificial Reefs: An Assessment of Issues and Methods	$8.00
Economic Analysis of Artificial Reefs: A Pilot Study of Selected Valuation Methodologies	$8.00
Application and Evaluation of an Artificial Reef Siting Model in Gaveston, Texas, Region	$6.00
A Review of Funding Sources for Artificial Reef Development	$6.00
Potential Sources of Artificial Reef Materials	$6.00
Artificial Reefs and Fishery Conflicts	$6.00
A Planning Guide to Recreational Artificial Reef Development	$8.00
Exclusion Mapping for Artificial Reef Site in the Gulf of Mexico	$20.00
An Assessment of Artificial Reef Use and Management and Its Effect on Recreational and Commercial Fishermen	$10.00

OTHER PUBLICATIONS

A Guide to the Construction of Freshwater Artificial Reefs	$2.50
Artificial Reefs in the Gulf of Mexico	$2.50
Artificial Reef Bibliography: A Reference Guide	$50.00

These publications can be obtained from:

Sport Fishing Institute
1010 Massachusetts Avenue, N.W., Suite 320
Washington, D.C. 20001

Make check or money order payable to:
Sport Fishing Institute

FINANCIAL SUPPORT

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Sport Fishing Institute

ARTIFICIAL REEF DEVELOPMENT CENTER

The Sport Fishing Institute is a non-profit fisheries conservation and education organization representing the interests of the angling public and the sport fishing industry. Since 1949, the Sport Fishing Institute has worked to protect and enhance our nation's fisheries resources and habitat for public use and enjoyment. In addition to promoting conservation, we strive to understand the social and economic activities which impact our fisheries resources.

Tina L. Berger, Director
Brochure layout by Irma S. Moody

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ARTIFICIAL REEF DEVELOPMENT CENTER

Artificial reefs have been providing more and better fishing opportunities for recreational anglers and boaters for many years. Whether the reef is a large sunken vessel several miles offshore or a small brush shelter placed in a popular bass fishing lake, its presence indicates that some individuals or organizations wanted to improve fishing in the area. More than likely the reef was placed through a cooperative effort between a sport fishing group and the local fisheries agency.

Unfortunately, in the past, artificial reef development in this country was undertaken on a "piece-meal" basis due to inadequate management and planning, insufficient funding, and an unreliable supply of reef materials. And most of all, it has been hindered by a lack of communication and exchange of information between the states and organizations involved in artificial reef development.

This has resulted in artificial reef builders in one area repeating the mistakes made by those constructing artificial reefs in another part of the country. In other cases, new innovations and ideas in the technology of reef construction and placement have not been communicated as widely as they should have been. The time had come for an information clearinghouse with a national perspective that would function as a coordination center for the numerous entities making up the artificial reef constituency.

With this in mind, the Sport Fishing Institute (SFI) created the Artificial Reef Development Center (ARDC) in 1983. The ARDC program, like SFI, has three basic elements: service, research and education.

SERVICE

The ARDC provides information services to a diverse constituency of businesses, fishery managers, researchers, fishing and boating organizations, outdoor writers, civic and community groups and decision makers. ARDC's Artificial Reef Bibliography and Profiles Database provide the core of its information services.

Continually updated, the bibliography contains over 2,000 literature references on artificial reef development, research and management -- in both a technical and popular nature. It is available in both a computerized and printed format.

The Artificial Reef Profiles Database provides artificial reef coordinators, researchers and user groups, as well as state and regional fishery managers, with the most up-to-date and comprehensive information on artificial reef development, research and management. First developed in 1987 and updated and significantly expanded in 1991, the database contains detailed information on over 670 permitted artificial reef sites and 13 state programs throughout the coastal United States. Specific information on permitted reefs include: construction date, location, depth and type of materials deployed at each site; and material relief, profile, volume and footprint; the type and extent of monitoring and research activities conducted at the reef site; the primary user groups; and special management designations and fishery regulations that are in effect. Information on state programs include: the status and availability of state artificial reef plans, the level of funding and personnel involvement in the program, and the type and extent of research and monitoring efforts undertaken by each state.

The ARDC, through its involvement with regional fishery management commissions and councils, state coordinators, and researchers, maintains a list of names and addresses of those individuals most involved in artificial reef development, research and management throughout the United States and in many other countries.

RESEARCH

The ARDC has undertaken research on some of the problem areas of artificial reef development, such as the permitting process, maintenance of reef buoys, costs of transporting reef materials for deployment, liability concerns, the economic valuation of reefs and siting considerations. The ARDC Technical Report Series disseminates the results of these studies to the public.

As part of its research function, the ARDC has developed a preliminary site planning tool called exclusion mapping. Exclusion mapping concentrates artificial reef siting efforts in areas where they will be of most benefit to marine recreational fishermen by identifying zones of high recreational fishing use and then mapping the areas within these zones where artificial reefs should not be sited due to user conflicts or navigational hazards. Thus, exclusion mapping is an invaluable management tool for artificial reef program planners.

EDUCATION

The ARDC uses several avenues to educate the public on artificial reefs. The quarterly newsletter, REEF BRIEFS is sent to over 600 individuals and organizations, providing them with news on both national and state level artificial reef programs, the latest artificial reef

United States Department of the Interior

MINERALS MANAGEMENT SERVICE
Washington, DC 20240

SEP 2 1993

Honorable Gerry Studds
Chairman, Committee on Merchant
Marine and Fisheries
House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

We are pleased to enclose responses to questions submitted to Mr. Henry G. Bartholomew of the Minerals Management Service by the Subcommittee on Oceanography, Gulf of Mexico and Outer Continental Shelf (OCS), and the Subcommittee on Fisheries Management. These questions are in followup to the June 29, 1993, joint hearing on OCS lease abandonment issues.

Thank you for the opportunity to provide this material to the Committee. If you have any questions or need additional information, please let us know.

Sincerely,

Tom Fry

Tom Fry
Director

2 Enclosures

cc: Honorable Solomon Ortiz
House of Representatives
Washington, DC 20515

Honorable Thomas Manton
House of Representatives
Washington, DC 20515

Response to Questions Posed by Chairman Ortiz Following Testimony of Henry G. Bartholomew before House Merchant Marine Committee on June 29, 1993

Question 1: We have heard from several witnesses about the possibility of future assignment of leases to smaller operators. Does MMS have figures on the number of facilities that may be assigned to such operators in the future, and the Federal costs of cleaning up these sites should site clearance fail to occur?

An average of 1,800 lease assignments have been processed each fiscal year since 1986. Assignments for 2,803 leases were processed in 1992. The MMS estimates that it will receive 2,600 requests for lease assignment in FY 1993 and 2,300 in FY 1994. Nearly 3,800 platforms and other structures are located on the more than 5,500 active OCS oil and gas leases in the Gulf of Mexico. However, MMS does not have figures on the number of facilities which may be assigned to smaller operators in the future.

Current estimates show that 224 of the more than 1,600 producing leases in the Gulf of Mexico are operated by smaller operators. These leases contain 1,152 wells and 448 platforms. Based upon end-of-lease costs for a typical developed lease in less than 200 feet of water, the 224 leases operated by these smaller operators could represent abandonment, removal and clearance costs between $590 and $880 million. The bulk of these costs will become due by the year 2005 when the majority of today's platforms will have reached the end of their life expectancy.

In view of the many assignments that are being made from major oil companies and large independent producers to smaller operators (i.e., operators who may have insufficient assets to assure the payment of end-of-lease abandonment and cleanup obligations,) MMS is requiring the submission of supplemental bonds by assignees when assignments are to operators who can not demonstrate the ability to pay the estimated costs of end-of-lease obligations. Supplemental bonds are required in amounts sufficient to assure that funds necessary to pay end-of-lease well abandonment, removal, and clearance costs will be available should the assignee be unable to perform these obligations in the future.

Question 2: What is the status of the current rulemaking effort on bonding? Briefly describe the current proposed bonding rule.

The final bonding rule is in the final stages of review within the Administration prior to publication. The proposed rule would increase the amount of the bond required for operations on the OCS according to the degree of lease development. The amounts required currently are $50,000 for a single lease, or $300,000 to cover all activities in a given OCS area (areawide bond). The proposed rule would require an increase in the bond to $200,000, or $1,000,000 areawide, at the time of lease exploration. Another increase to $500,000, or $3,000,000 areawide, would be required when development activities are initiated.

Question 3: Will this increased bonding level protect the Federal Government in the event that a number of smaller operators go bankrupt?

The increased level of bonding which MMS proposes together with MMS's requirement that an operator provide supplemental bond coverage when it (the operator) can not demonstrate financial capacity to pay its end-of-lease abandonment and cleanup obligations will provide a greater level of protection for the Federal Government in the event that a number of small operators go priority obligation of any bankrupt lessee as it did in the Alliance Operating Corporation bankruptcy.

The MMS is developing a broad comprehensive approach which integrates MMS's policy of "residual liability" with alternative means for funding end-of-lease abandonment and clearance costs. The MMS will hold an assignor responsible for end-of-lease costs when the current lessee (assignee) fails to perform end-of-lease abandonment and cleanup obligations. The alternative means for funding end-of-lease obligations which MMS has under consideration include self-insurance, third-party guaranties, and lease abandonment escrow accounts (i.e., pay-as-you-go supplemental security in the form of lease specific escrow accounts established to pay end-of-lease abandonment and clearance costs).

Question 4A: In terms of the environmental effects of converting oil and gas structures to artificial reefs, have there been any detailed environmental studies done to date?

Artificial reefs have been a point of conversation and studies on an international scale. It is universally agreed that artificial reefs will support biological communities. The numerous studies have addressed emplacement and locations of artificial reefs, materials used in the construction of reefs, and construction techniques. In terms of environmental effects, the varying combinations of location, materials, and techniques will result in very specific information.

The MMS has in cooperation with other agencies supported studies which attempted to address the environmental effects of converting oil and gas structures to artificial reefs. The MMS Gulf of Mexico Region has numerous in-house articles on the topic as well.

Question 4B: Are Environmental Impact Statements [EIS'] required by the National Environmental Policy Act (NEPA) for 'Rigs-to-Reefs'?

No EIS' are required because "Rigs-to-Reef" conversions do not significantly affect the quality of the human environment. As a continuing basis for such a conclusion, MMS prepares a corroboratory Environmental Impact Analysis (EIA) for each structure removal proposed in the Gulf of Mexico (GOM). In the EIA, MMS describes the proposed fate of the structure to be removed; in this case the proposed transformation of a "rig" to an artificial reef. Such an analysis details how the proposed removal would be accomplished, as well as the anticipated effects of the transformed structure at its new site (if known).

Question 5A: Has MMS been party to the investigation of the stranding of a large number of endangered sea turtles along the Louisiana coast this spring?

Although principal responsibility for investigating the strandings rests with the National Marine Fisheries Service (NMFS), MMS has cooperated with NMFS to the maximum extent practicable because of the potential effect of structure removals on strandings. Because not all of the 90 to 105 turtles stranded east of the Mississippi Delta shortly before and after the Memorial Day weekend were recovered and most were in advanced stages of decomposition, only 4 or 5 were necropsied, with inconclusive results. Still, there were no indications of trauma of the kind associated with structure removals.

Question 5B: Has MMS investigated whether this [turtle mortality] was in connection with ongoing demolition activities?

Yes, MMS has determined in cooperation with NMFS that none of the five structures removed with explosives in the GOM from April 14, 1993, and June 15, 1993, caused any turtle mortality or injury. Under procedures MMS and NMFS developed in 1986 and refined in 1988, NMFS observers monitor all removals employing explosives to ensure no protected species are in the vicinity of an operation where they may be injured or killed. All but one of the removals between April and June 1993 were over 100 miles west of the delta. The earliest removal, and the one closest to the delta, was on April 14 (over a month before the strandings began) about 40 miles west of South Pass. The NMFS observers saw no turtles before, during, or after that removal.

Question 5C: Does MMS have estimates of the number of turtle mortalities that have occurred in the past in conjunction with site clearance activities, and if so how many?

Through the removal monitoring program instituted by MMS and NMFS in 1986 [noted above], MMS knows that no turtle mortality has occurred during the over 700 removals that employed explosives. Before 1986, only two turtle mortalities were documented.

Question 6: What specific site clearance requirements are there for sites in greater than 300 feet of water?

Answer: Since shrimping and other trawling activities do not usually take place in waters deeper than 300 feet, site clearance requirements are different than those in shallower water. Sites in greater than 300 feet of water are required to have a high frequency sonar search conducted over the defined area and are not required to be trawled. The sonar instrument operating frequency scanning range and deployment method (stationary or towed) must be stated in the procedural plan submitted for approval. Any debris indicated by the sonar survey must be recovered.

Question 7: To what degree is the high number of fish found in association with rigs due to aggregation rather than enhanced production? Does this affect the Gulf fisheries?

The question of aggregation versus enhancement has been addressed in studies both in the Gulf of Mexico and the Pacific Regions. The complexity and difficulty in addressing the question has prevented scientists from achieving a conclusive answer at this time.

The Gulf of Mexico has limited natural hard substrate. Offshore rigs provide additional hard substrate supporting biofouling communities, sources of food for some species, and habitat for eggs and larvae of others. The harvesting of mussels from California oil rigs is a regular industry. These mussels consistently exhibit lower levels of pollution than mussels taken from Bodega Bay. It is well known in the Gulf of Mexico that the presence of rigs has increased recreational fishing. The rigs provide habitat for fish, which in turn provides fishermen with known offshore fishing locations for various recreational species.

Question 8: Since the majority of the rigs-to-reefs sites are in Federal waters, why has the Federal Government relinquished all revenue generated from the program to the States?

The program does not generate any revenues per se. It has been customary for companies donating structures to States for use as reefs also to donate to those States an amount of money approximately equal to one-half of the amount saved by the company by not having to tow the structure to land and dispose of it. In

Response to Questions Posed by Chairman Manton Following Testimony of Henry G. Bartholomew before House Merchant Marine Committee on June 29, 1993

Question: What safeguards are in place to prevent damage to fishing gear?

Answer:

- While site clearance is in progress the location is marked as a navigation hazard in accordance with U.S. Coast Guard regulations.
- Wellheads, casings, pilings, and other structures must be removed to prevent them from becoming navigational hazards or impeding other uses of the OCS.
- Verification of site clearance is required and may be accomplished by one of the following methods:
  1. Dragging a trawl in two directions (i.e., N-S and E-W) across the location.
  2. Performing a diver search.
  3. Scanning with a side-scan or on-bottom scanning sonar.
- MMS's "Fisherman's Contingency Fund Hangs Data Base" can be consulted to see if any recorded hangs are located within a certain area before commencing with any fishing or trawling activity in that area.
- Louisiana Department of Wildlife and Fisheries publishes a series of recreational fishing maps complete with locations of oil and gas platforms, artificial reefs, wrecks and hazards.

Question: How often is fishing gear entangled in sunken oil rigs?

Answer: The exact number of incidents of damage to fishing gear is not known, since many such problems encountered are mutually resolved between the shrimpers/fishermen and the oil and gas industry. The following statistics refer to actual claims filed by shrimping/fishing industry.

Year	Number of Claims
1989	172
1990	193
1991	128
1992	98

Question: Do the reefs increase productivity or merely concentrate populations of aquatic organisms?

Answer: Recent studies have determined that the answer to this question depends upon the availability of suitable natural habitat in the areas in question. In areas of very limited natural fish habitat such as the Western Gulf of Mexico, highly significant increases in fish population occur due to the presence of oil and gas structures. In areas where natural reefs exist, the impact of oil and gas structures are not believed to result in as great an increase in fish.

Question: What other artificial reef projects are being undertaken by the various coastal states?

Answer: Each of the five coastal states bordering the Gulf of Mexico (i.e., Texas, Louisiana, Mississippi, Alabama and Florida) have artificial reef programs and are actively involved as members of the Gulf States Marine Fisheries Commission's (GSMFC)

Recreational Fisheries Management Subcommittee which, since 1990, has involved itself primarily on artificial reef development and management issues. Although MMS cooperates with the states and the GSMFC, it does not maintain official records of all artificial reef projects, particularly in the planning stages.

Question: What are the cumulative impacts of these and other artificial reefs being installed by Coastal State fishery agencies?

Answer: Several research projects are being conducted by states evaluating the effects of artificial reef development. MMS has cooperated with and made data available to researchers, but we are not aware of any definitive analysis of cumulative effects.

Question: Who benefits most from this program: the oil and gas industry or the fishing industry?

Answer: Both the oil and gas and fishing industries benefit greatly from this program, but MMS does not have any data to evaluate comparative benefits. In addition, coastal states also benefit because they have been able to develop reefs at a significantly reduced cost due to the contribution of materials by the oil and gas industry. Similar reefs have been developed by other countries, Japan, for example, at a very large state expense.

Question: Do some sectors of the fishing industry benefit at the expense of other sectors of the fishing industry?

Answer: We are not aware of the comparative effects of reefs on various segments of the fishing industry. The National Marine Fisheries Service has a more direct responsibility in this area.

Question: What are the differences in the Texas and Louisiana programs and which program most benefits the fishing industry?

Answer: Each state program is unique and the respective state agencies would be able to describe their programs in detail. In addition, the National Marine Fisheries Service and the Army Corps of Engineers, which has federal regulatory responsibility with respect to artificial reefs, have a more active role in this area than MMS which has only a consulting role to the Corps.

Question: Have any environmental impacts been documented for the ongoing rigs to reefs program?

Answer: There have been many papers and studies done by various groups. For example, we understand that currently the Gulf States Marine Fisheries Commission is looking at how much more productive acreage is available for fishing compared to shrimping. As far as we are aware, there has yet to be any indication of adverse impacts of the program. However, MMS's responsibility is limited to the environmental impacts of oil and gas development and production. The Corps of Engineers, which is the federal entity responsible for issuing artificial reef permits, has a much more direct authority for the program.

Question: How serious is the threat of environmental contamination from traces of oil that may be associated with these structures?

Answer: There is little or no threat of environmental contamination from traces of oil associated with obsolete oil and gas platforms. Lessees must properly plug wells to prevent fluid leakage. When pipelines are abandoned, MMS rules ensure that the lessee abandons the line in a manner that will prevent hydrocarbon seepage and minimize conflicts with other OCS uses. Any presence of oil on the rig itself after abandonment would be negligible.

Question: Can converted rigs be moved by hurricanes, tropical storms, and normal ocean currents?

Answer: Normal ocean currents as well as currents associated with hurricanes and tropical storms scour the sea floor under any object resting there. A converted rig would thus tend to burrow in rather than move laterally.

There are three basic procedures which have been used in past conversions from rigs to reefs. First, the platform piles are severed and the platform moved to another site, with or without removing the topside decks, This is by far the most common procedure. Second, the platform may be toppled at the site where it is located, again with or without removing the topside decks. Third, the topside decks can be removed and the jacket cut off at water level or slightly below the water level and the platform left in place. Each of the methods has pros and cons as to whether they should be used in a particular instance and the decisions are made only after consultation with concerned Federal and State Government agencies.

Normal ocean currents do not affect the position of rigs left as reefs since there is very little buoyancy in the remaining material. There may be some sea floor scouring which has the potential to cause slight shifts in the "reef" orientation or position but there will be no large movements.

Currents induced by storm surges occurring during tropical storms, or more importantly occurring during hurricanes, have the potential to move unattached materials some distance depending on their mass and the size of their exposed surface area. These movements would not be as severe as the movements one would expect from floating units but they could be a few tens of yards in shallow water. Most current artificial reefs are located in relatively shallow water in the range of 100-300 feet. One of the pros considered for the second and third methods listed above is that the rigs are not necessarily separated completely from their anchoring pilings and thus would not be expected to move significantly even in storm surges. Part of the analysis conducted when considering a site for establishment of an artificial reef is whether or not there are nearby structures that could be damaged if the reef material should shift during storms. As with normal currents, the currents associated with storm surges would tend to cause scouring of the sea floor under the material with the result that it would tend to burrow in rather than to move any large distance.

AD HOC OCS LEASE ABANDONMENT AND BONDING ISSUES COMMITTEE
COMMITTEE REPORT

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V. Summary

I. INTRODUCTION

In order to protect the federal government from loss due to the failure of an Outer Continental Shelf (OCS) oil and gas lessee to perform in accordance with lease obligations, government regulations require the posting of lessee surety bonds.[1]

These bonds secure the payment of royalty and the proper conduct of operations as well as the proper performance of three obligations which come due at the end of a lease:

i) Plugging of wells;

ii) Abandonment (removal) of platforms and other structures; and

iii) Lease site seafloor clearance.

Regulations also provide that bond requirements may be raised on a case-by-case basis.

The Minerals Management Service (MMS), the agency charged with management of the OCS leasing program, has identified several problems with regard to the current bonding system. Among them is the fact that the monetary values of such bonds, as designated in the current regulations, were established over twenty years ago and are inadequate in light of present day economics. Also, the application of higher bond requirements on a case-by-case basis is a time intensive process which may result in inconsistencies. Finally, as the OCS oil and gas industry has evolved, a greater number of companies are taking assignments of producing properties, thus raising risk to the government.

Motivated by these concerns, the MMS issued a Notice of Proposed Rulemaking January 24, 1990, calling for increases in the levels of surety bond coverage required of lessees. The MMS has challenged the offshore industry to develop recommendations for improving the system for providing security for OCS lease obligations, specifically concentrating on end-of-lease obligations.

An ad hoc committee (Committee), including representatives from the National Ocean Industries Association (NOIA), American Petroleum Institute (API), Independent Petroleum Association of America (IPAA), Offshore Operators Committee (OOC) and majors and independents, has devoted considerable time to the issue. The Committee formulated a variety of possible solutions and reviewed possible solutions proposed by other parties, including recent MMS proposals. The Committee's findings have been distilled into the recommendations contained in this Committee Report.

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[1] The terms "lessee" and "assignee" as used herein are generally intended to mean a holder of a record title interest in the lease.

II. DEFINITION OF PROBLEM

Many producing OCS leases acquired by oil and gas companies during the last 40 years have matured, production has declined significantly, and the leases are no longer economically attractive for those companies to operate. Also, many companies are experiencing capital budget constraints brought on by increased regulation, a constantly changing political atmosphere, and price fluctuations. This has resulted in the sale of assets and transfer of leases to an expanding number of newly qualified lessees.

In most cases, these leases have been developed through the investment of millions of dollars in lease bonuses and platform and well costs, and now those improvements will require significant expenditures for removal and abandonment.

The current lessees have dealt with these problems associated with producing properties as follows. First, the leases can be relinquished and the platforms removed and wells abandoned. This could result in oil and gas reserves being prematurely abandoned, with little hope that these reserves will be recovered in the future since the remaining reserves would not justify the investment costs for additional wells and platforms necessary for their recovery. Second, the leases can be assigned to companies whose economic requirements and overhead expenses allow them to continue to recover reserves well past the point at which the original or previous lessee might have determined a lease to be economically unattractive. These assignments must be approved by the MMS and, theoretically, the assignee must meet the requirements imposed by the MMS at the time of the assignment. To date, the latter option has been preferred by an overwhelming margin.

Currently, 1000 separate entities have been qualified as lessees of OCS leases. Many of these OCS lessees can be classified as *small* under Small Business Administration criteria. This has led to MMS concern over defaults with respect to platform removal and well abandonments. In fact, the MMS has stated that the estimated cumulative lease abandonment cost is approximately five billion dollars. These figures are, however, misleading in that they are only estimates of the total cost to abandon all OCS leases - they do not represent the exposure, if any, of the government due to lessee defaults on abandonment obligations. To date, the MMS has not made any out-of-pocket expenditures for lease abandonment costs, despite approximately 40 years of OCS leasing activity. Any rigorous analysis of the MMS' potential exposure for lease abandonment, to the extent that any exposure exists, clearly demonstrates a figure that is an order of magnitude less than the MMS' estimate of cumulative lease abandonment cost. An analysis was performed by the Committee of the potential exposure of the MMS, which contained a number of assumptions; namely, that seventy-five percent (75%) of all producing leases in the Gulf of Mexico are transferred to independents, that the average cost for removal is approximately $1 Million for a major structure, $432,000 for a minor structure and $75,000 for each well abandonment, and an assumed failure rate of ten percent (10%) for independents. The analysis utilized a count of 1887 major structures, 1995 minor structures and 14,163 wells in the Gulf of Mexico as of October 1991. This exercise, based on this default assumption, yields a worst case scenario exposure to the MMS of approximately $287 Million.

The MMS has, to date, responded to this perceived concern by first proposing an increase in the standard lease or area-wide bond requirement for OCS lessees and operators (30 CFR §256), as set forth in Section III.C.

Second, the MMS often requires additional security in the form of a supplemental bond or other acceptable surety. (30 CFR §256) However, this requirement imposes great administrative burdens on the MMS since it has been implemented on a site specific basis and requires both an estimate of abandonment liabilities and an assessment of the risk of default. In many cases, otherwise acceptable assignees have failed to meet, or have experienced great difficulty in meeting, the MMS' imposed supplemental security requirements.

Thus, a system should be developed which will allow the following objectives to be satisfied:

i) Minimize the financial risk associated with a lessee's default on its obligations for platform removal and well abandonments;

ii) Assure that the government preserves the economic life, conserves the natural resources, maximizes recovery of existing reserves, and continues the attendant royalty revenues to the extent it is feasible to do so;

iii) Encourage opportunities for competition and entrepreneurship by small, but viable, companies as OCS lessees, while at the same time imposing appropriate standards to insure that the lease abandonment obligations can be met; and

iv) Assure that no lessee will be unfairly penalized or subsidized.

The system by which these objectives are realized should have the following characteristics:

i) As an essential cornerstone, all parties involved in the assignment transaction must act responsibly;

ii) The MMS' procedure for assessing abandonment liability and lease reserves should be reasonable, consistent, and well understood;

iii) Assignment approval requests should be handled in a routine and timely manner and with reasonable administrative burdens;

iv) Assignees should have the ability to meet financial responsibility requirements without tying up constrained capital resources in unproductive security instruments;

v) The MMS' criteria for screening potential assignees/lessees for possible exemption from supplemental security requirements should include a weighing of the historical operating record of the company and not solely financial status; and

vi) An open and competitive market for OCS leases should be encouraged through the efficient transfer of producing properties to other lessees that are willing to continue to produce the properties, consequently extending the economic life of existing reserves and increasing the federal revenues that accrue to the nation's benefit.

III. CURRENT PRACTICE AND MMS PROPOSALS

A. Standard Lease and Area-Wide Bond

Current regulations (30 CFR §256.58) require each OCS lessee to obtain a surety bond to secure performance of lease obligations. The Secretary of the Treasury is empowered to authorize a surety corporation to provide surety bonds when required by the law of the United States. 31 USC §9305. Pursuant to 31 CFR §223.16, the Secretary is to publish annually, as of July 1, in *Department of the Treasury Circular 570*, a list of qualified corporate sureties. Until 1988, the MMS required corporate sureties underwriting OCS bonds to be listed in *Treasury Circular 570*. Because of the administrative burden created by deviating from this practice, the MMS has proposed to require by regulation that corporate sureties be listed in *Treasury Circular 570*. 55 Fed. Reg. 2388 (January 24, 1990); corrected 55 Fed. Reg. 3603 (February 2, 1990). Until the regulation is finalized, the MMS has indicated that it will follow the criteria for determining the adequacy of a surety outlined in *Treasury Circular 297*.

Pursuant to 31 USC §9303, federal agencies may accept the pledge of bonds, notes, or other obligations issued or guaranteed by the United States as security in lieu of surety bonds. The MMS requires use of its bond form which includes prescribed endorsement (pledge) language. If security is other than a surety bond, the MMS requires the depositor to place the treasury bond or note in a pledge account in a Federal Reserve Bank with the MMS as pledgee. Additionally, the MMS has begun accepting zero-coupon treasury instruments in lieu of surety bonds but only if the current market value meets or exceeds the requisite bond amount.

Bonds may be obtained for an individual lease or for an entire OCS area (e.g., the Gulf of Mexico). The current standard lease bond amount is $50,000; the area-wide bond amount is $300,000. (The MMS may retain these levels or require higher levels as described below).

B. Supplemental Security

The MMS has the authority (at 30 CFR §256.61) to require additional security in the form of a supplemental bond. The MMS has recently established a supplemental bond procedure policy (dated May 7, 1992). It exempts from supplemental bonding requirements a lessee:

- i) With total employment of 500 or more;
- ii) With a minimum net worth of $35 Million or with minimum annual sales of $45 Million;
- iii) Which is restricted from joint bidding on OCS leases; or
- iv) Which has a co-lessee that meets the above criteria.

The MMS may review a company for supplemental bond candidacy at any time, but such review has become automatic when there is an assignment of record title interest which effects a transfer of abandonment liability.

Steps in establishing supplemental bond amount include:

- i) Estimate abandonment liabilities; and
- ii) Estimate oil and gas reserves and future lease revenues.
    - a. If estimated future lease revenues are insufficient to fund abandonments, the lessee is required to post an initial supplemental bond for the full amount of estimated abandonment costs.
    - b. If future lease revenues are sufficient to fund abandonments, a supplemental bond will be set at the greater of 50% of the abandonment estimate or the percentage of annual reserve depletion and will increase annually ("variable bond") in proportion to reserve depletion until abandonment costs are covered. Reduction of the initial supplemental bond from the 50% level will be allowed based on sufficient showing by lessee of:
        - (1) financial strength;
        - (2) trade references; and
        - (3) track record.

      The bond will be adjusted based on an annual review.

C. MMS Proposed Increased Bonding Requirements

The MMS has proposed to increase the standard lease and area-wide bond amount in accordance with the stages of development of a lease. 55 Fed.

2388 (Jan. 24, 1990); corrected 55 Fed. Reg. 3603 (Feb. 2, 1990). Below is a summary of the proposal:

	Individual Lease	Area-Wide
Lease Bond	$ 50,000	---
With Application for POE	2 ~~$3~~00,000	$1,000,000
With Application for DOCD	$500,000	$3,000,000

D. Abandonment Insurance Fund

The MMS has proposed a 3-tier "Financial Security Plan." The elements of this plan are:

i) Basic Foundation: This would consist of the minimum bonding requirements set forth in MMS regulations. This assumes adoption of the proposed rule regarding bond amounts.

ii) Additional Bonds: These would consist of supplemental bonds, Treasury pledge accounts, abandonment accounts, self-insurance, or a combination thereof.

iii) Abandonment Insurance Fund: This would be an offshore well abandonment, platform and facility removal, and seafloor clearance fund which would serve as the payor of last resort when a lessee defaults on its lease abandonment and cleanup obligations.

Several problems exist with regard to the implementation of an abandonment insurance fund. The most obvious is securing a method for funding it. Assessments based either on volumes of production or number of wells would burden large companies without any relation to the risk created by assignments. However, the burden on small assignees would even be relatively greater, as they would be exposed to triple-dipping (standard bond, plus supplemental bond, plus contributing to a fund). In addition, it is unlikely that such an arrangement would receive favorable tax consideration as "insurance" for any participant.

If the MMS maintained the fund itself, the fund would be subject to being raided by Congress for unrelated expenditures. Additionally, legislation would probably be required in order to create the fund.

Securing agreement on the minimum amount which should be in the fund would be problematic as well. This would be especially complicated by the intervention of Congress (reference the experience with certificate of financial responsibility amounts during Oil Pollution Act of 1990 discussions).

Finally, the concept of a payor of last resort has the unintended effect of discouraging an exacting analysis of assignee's financial ability on the part of assignors and the MMS, as both parties would recognize that the expenses from an error in judgment would be subsidized by others through the fund. The unintended result might be an increase in defaults on the part of OCS lease assignments.

Two other alternatives for funding have been proposed. One would be to tap the former Offshore Pollution Compensation Fund. This would be problematic because the fund no longer exists, having been rolled into a much larger Oil Spill Liability Trust Fund. The second would be to actually have an insurance fund underwritten by a commercial insurer. However, there is no current insurance market for this exposure in terms of any risk-shifting to commercial insurers, as lease abandonment expenses not resulting from a fortuitous event are not insurable. Thus, the term "insurance fund" is misleading in this context.

IV. RECOMMENDED PLAN

The Committee recommends that the following plan be adopted and implemented in response to the problem of OCS lease plugging and abandonment addressed in this report. This recommended plan contemplates both the refinement and revision of current MMS practices and, except as otherwise noted, is intended to be in lieu of current MMS proposals.

A. Refine Existing Practices

It is currently extremely difficult for industry to plan business on a long-term basis and assess the impact of supplemental bonding requirements since those requirements have been subject to constant change, revision and uneven application. This uncertainty discourages long-term investment in OCS properties by the potential assignee/lessee and, as a result, has an adverse impact on revenues to the lessor. Not only is the amount and type of security which may be required by the MMS uncertain from transaction to transaction, but uncertainty on ultimate legal issues, such as the MMS' recent change in position on assignor residual liability, further aggravates the problem.

Despite these problems, considerable improvement could be obtained simply by refining and/or clarifying existing practices and/or procedures.

1. Standard Lease and Area-Wide Bond

The current standard lease and area-wide bond amounts, $50,000 and $300,000 respectively, have remained unchanged for more than 20 years. All segments of the industry seem to be in agreement that the bond amounts should be increased and should be adjusted based on the stage of lease development, in accordance with the MMS' recent proposal.

Additionally, the MMS' apparent practice of requiring only designated operators, but not non-operating record title interest holders, of an OCS lease to obtain a lease or area-wide bond should be revised to be consistent with applicable regulations which require such a bond to be posted by all co-lessees with a record title interest. A lease or area-wide bond should be required of every lessee holding a record title interest as a threshold criteria for holding such an interest in an OCS lease or leases. However, the current practice of relieving a non-operating lessee from posting a lease or area-wide bond should be retained in the event that the operator or the affected co-lessee waives this requirement.

2. Criteria for Exemption from Supplemental Security Requirements

The criteria for exemption from supplemental security requirements currently utilized by the MMS were set forth in an information sheet dated May 7, 1992, and are not specific to the oil and gas industry. The criteria, apparently borrowed from the Small Business Administration, were developed for purposes unrelated to assessing supplemental security needs on the OCS.

Although the criteria would identify a rather large company, they are not necessarily reliable indicators of a financially successful company that will be able to satisfy its future abandonment obligations. Additionally, these criteria filter out some small, but financially successful, companies and place others at a competitive disadvantage by requiring constrained capital to be employed to provide security for abandonment obligations.

The current criteria also exempt from supplemental security requirements a co-lessee when another of its co-lessees is exempt. This practice apparently assumes joint and several (solidary) liability among co-lessees and encourages a race to divest among exempt companies. Especially in the case of assignments, instead of encouraging exempt companies to remain as co-lessees, this policy has the opposite effect. For these reasons, this criterion should not be a basis for an exemption from the requirement for supplemental security.

The industry is in general agreement that exemption from supplemental security requirements is appropriate when properly established criteria are satisfied. The current exemption criteria should be revised and/or supplemented so that they are easily understood and applied and provide adequate protection against default; but do not unreasonably penalize small, but financially responsible, companies.

In furtherance of this goal, additional criteria for exemption which more accurately reflect a lessee's sound fiscal condition should be considered as suggested later in this report in Section IV.B.2. If any one of the proposed criteria is satisfied, the lessee should be exempt from supplemental security requirements.

3. Procedures for Determining the Amount of Supplemental Security

As a starting point, the amount of supplemental security to be required of a non-exempt lessee should be determined by estimating the total abandonment obligation for a particular lease and prorating it in accordance with the lessee's record title interest in that lease. For example, if the total abandonment obligation is estimated at four million dollars for a lease and the non-exempt lessee has a 25% record title interest in that lease, the non-exempt lessee would have to post supplemental security in the amount of one million dollars.

Additionally, a non-exempt lessee should only be required to post supplemental security in the event that the security previously posted by that lessee is inadequate to cover the lessee's current lease obligations. For example, if the proposed increased bonding requirements are implemented, and a lessee has previously posted a three million dollar area-wide bond, that lessee should not be required to post supplemental security until its estimated lease obligations approach three million dollars.

Of paramount importance is the development of a procedure that reduces administrative burdens by allowing the abandonment costs to be established in a timely manner and with reasonable and predictable accuracy. Two methods should be available to determine the abandonment costs associated with a particular lease.

i) Historical costs for similar platforms and wells in comparable water depths can be used to estimate abandonment costs. As a starting point, a table similar to that set forth as Exhibit "A" should be developed to timely and accurately estimate costs.

ii) Current abandonment estimates could be prepared for specific sites by third party consultants. These third party consultants, which would be compensated by the lessee, could be utilized to either establish an abandonment cost estimate where the historical method would not be satisfactory, or simply to expedite the approval of an assignment request.

4. Streamlined/Revised Procedures to Facilitate More Timely Review of Assignment Requests

There is currently often a long and unnecessary delay in processing assignment requests. Streamlined and revised procedures would allow assignment requests to be processed in a more timely manner, while at the same time improving the integrity of the process. Some of these revisions have been previously discussed, but are summarized in the following list:

i) More relevant "financial strength" tests should be established for the purpose of determining whether supplemental security will be required. The criteria for exemption should be easily understood, easily determined, and consistently applied.

ii) Historical data should be gathered, integrated, and periodically updated to allow reasonably accurate abandonment costs to be estimated without excessive administrative burden and review. See again attached Exhibit "A."

iii) Certain tasks should be approved for "out sourcing" to ease administrative burdens, resolve differences between the lessee and the MMS, and facilitate MMS' handling of routine requests. The MMS should establish criteria for outside consultants who would be authorized to perform abandonment cost estimates, reserve estimates and financial analyses. These costs would be borne by the lessee/applicant, not the MMS, like the costs of certified verification agents for platform designs.

5. Types of Supplemental Security

Currently, the MMS accepts supplemental security in only two forms:

i) Surety bonds; and

ii) Pledge of Treasury securities.

The first device is not only costly, but it also diverts capital which produces no benefit to the lessee that is financially responsible and able to perform its obligations. The second device, although of some benefit to the lessee, still represents a substantial and perhaps unnecessary diversion of capital if the full amount of the supplemental security must be posted at the time of lease acquisition. Where the abandonment costs can be entirely funded out of the revenues from future production, the amount of the securities pledged should be more closely tied to proved reserves depletion and "ratcheted up" in accordance with the anticipated depletion schedule, thus allowing the lessee to "pay as you go" for abandonment obligations.

Three other security devices not presently acceptable to the MMS are recommended: letters of credit, sinking (escrow) funds and third party guarantees. These devices will be more fully discussed in Section IV.B.3.

B. Revise Practices to Produce More Flexibility

1. Supplemental Security Amount

As previously discussed, it is essential that the supplemental security required of a non-exempt lessee be prorated to that lessee's record title interest. To require a non-exempt lessee to provide supplemental security in excess of its record title interest in the lease is not only unfair, unreasonable and arbitrary, but also results in unproductive duplicative protection that diverts capital from exploration and production activities.

Prior to requiring a non-exempt lessee to post any supplemental security, a determination should be made that the lessee's total abandonment costs, prorated for that lessee's record title interest in the lease or leases, meet or exceed the lease or area-wide bonds previously posted, especially if the amounts of these bonds are raised as currently proposed by the MMS. No supplemental security should be required of a non-exempt lessee whose total abandonment obligation is not estimated to meet or exceed bond amounts already posted.

Currently, if supplemental security is required, the MMS requires a minimum of 50% of the total estimated abandonment cost for a specific site, but only if certain criteria are met. Otherwise security in the amount of 100% is required. If it is expected that the entire abandonment cost could be funded from revenues derived from future production, the lessee should be allowed to "pay as you go." Rather than requiring that an arbitrary minimum of 50% of the non-exempt lessee's abandonment cost be put up as security at the outset, a more realistic and workable schedule would require the lessee to post at the beginning of each year that percentage of the abandonment cost that equals the anticipated cumulative percentage of proved reserves depleted plus ten percent. For example, if at the beginning of a certain year it is anticipated that at year end 30% of the remaining proved reserves would have been depleted, the non-exempt lessee would be required to post supplemental security in the amount of 40% of that lessee's estimated share of abandonment costs.

When an appropriate portion of the value of future production will fully fund the non-exempt lessee's share of estimated abandonment costs, there is no reason to require the non-exempt lessee to deploy constrained capital to prematurely provide security.

Perhaps the greatest improvement that can be implemented for the non-exempt lessee is the ability to secure the estimated abandonment costs on a "pay as you go" basis. Thus, only the actual capital necessary to provide the required security will be diverted from exploration and production activities.

2. Criteria for Exemption from Supplemental Security Requirements

Lessees that satisfy any one of the qualification criteria should not be required to post supplemental security. Certain elements of the criteria set forth in the May 7, 1992 MMS information sheet should be maintained, but additional criteria which more accurately reflect a lessee's financial strength should be added to the list. The current criteria recommended to be retained are as follows:

i) Total employment of 500 or more as evidenced by publicly available and independently accepted information sources;

ii) A minimum net worth of $35 Million in the most recent available year as evidenced by audited financial statements including auditor's certificate, balance sheet and profit and loss statement;

iii) Minimum gross annual sales of $45 Million in the most recent available year as evidenced by audited financial statements including auditor's certificate, balance sheet and profit and loss statements; or

iv) Inclusion on the MMS' restricted bidder list.

In addition to the foregoing, it is recommended that a lessee that meets either one of the following criteria, or other appropriate criteria which should be developed and adopted in the future, shall be exempt from posting supplemental security:

v) A net worth of $10 Million for the most recent available year as evidenced by audited financial statements including auditor's certificate, balance sheet and profit and loss statement, and a future cash flow of $35 Million from all categories of proved reserves, appropriately discounted at the prime rate announced from time to time by the *Wall Street Journal*, or any combination of net worth and future cash flow, as defined above, such that the sum of those values is equal to or greater than $45 Million; or

(NET OF LIABILITIES)

vi) A minimum net average production of 50 MMcf of gas per day equivalent, convertible at 6 Mcf per barrel, attributable to interests owned by the lessee seeking the exemption. For the purpose of applying this criterion, lessee shall include any subsidiary, partnership, limited partnership or other business affiliation controlled or managed by such lessee.

3. Types of Security

As previously recognized, the types of supplemental security acceptable to the MMS are rather limited. Other types of reliable security should be allowed which would reduce the drain on the lessee's constrained capital resources. The following security devices are recommended:

a) Sinking or Escrow Fund.

This is perhaps the best example of the "pay as you go" concept. Periodic payments would be made to the fund which would build value over time. As a minimum, the fund would be maintained outside of the lessee by an acceptable financial institution and pledged to the MMS. Contributions to the fund could be in cash, treasury bills, or some other liquid and safe security. However, to obtain the greatest protection from potential creditors of both the revenue stream contributed to the fund and the corpus of the fund itself, the fund could be set up as a trust account to be funded by an overriding royalty interest assigned to the trust. The MMS would be the contingent beneficiary of the trust in the event of the lessee's default.

The fund or trust could either be site or company specific. If site specific, the fund should attach to the lease and follow the lease in the event of future assignments. If company-specific, the non-exempt lessee should get credit for contributions previously made to the fund for satisfying current security requirements in the event of the assignment of a lease for which contributions had previously been made. Additionally, the non-exempt lessee should be relieved from contributing to a company-specific fund when the value of the fund equals the net worth required for exemption from supplemental security. These funds might have certain tax consequences, the details of which would have to be considered at the time of creation.

b) Third Party Guaranties

Provided a third party meets the criteria for exemption from supplemental security requirements established by the MMS, a guaranty of the abandonment obligations by that third party should be acceptable to the MMS. Since corporate surety bonds are very expensive, this flexibility would provide lessees with a cost-effective or no-cost alternative. In addition to being useful in parent/subsidiary relationships, third party guaranties should include the following:

i) Assignor Guaranty

There may be cases where an assignor may wish to remain liable for all or part of the abandonment obligations to facilitate the approval of an assignment. The transaction can be structured to accomplish this result. However, an exempt assignor should be allowed the option to provide a guaranty for a non-exempt assignee's/co-lessee's abandonment obligations.

ii) Abandonment Contractor Guaranty

It is recommended that a procedure be developed to allow contractors having the ability to perform all or part of the abandonment work to provide a guaranty or post a bond naming the MMS as a co-obligee. The pricing/payment terms for the bond/guaranty would be arranged prior to lease acquisition or the request for assignment approval. The contractor could accept as payment for the abandonment a prepayment, an overriding interest, or a combination, to fully fund the abandonment costs prior to the time for performance.

c) Letters of Credit

Letters of credit are currently accepted by the MMS as security in connection with royalty payment appeals. Automatically renewable or long-term, irrevocable standby letters of credit should be allowed as another alternative form for providing supplemental security.

d) Combination of Security Devices

A non-exempt lessee should be allowed to satisfy supplemental security requirements by combining two or more types of acceptable security devices. For example, the total amount of supplemental security could be provided in part in the form of a bond, with the remainder provided in the form of a sinking or escrow fund.

C. Critical Elements of Recommended Plan

To accomplish the objectives previously set forth, the Committee's recommended plan (or any alternative plan) should incorporate the following critical elements:

1. Total Package

The Committee's recommended plan is presented as a package and contemplates adoption and implementation on that basis. Selective adoption and implementation of specific aspects of the plan would likely perpetuate, not address, the OCS lease plugging and abandonment problem.

2. Lessee Pro Rata Responsibility

Each non-exempt lessee should be responsible for securing its prorated share of plugging and abandonment costs. This concept is confused by current MMS bonding practices, and requires clarification as a part of any comprehensive plan. This concept will enhance the administration of the plan by the MMS and will encourage OCS lease exploration and development activity through better industry understanding of respective lessee security requirements.

3. "Pay As You Go" Supplemental Security

If a non-exempt lessee's prorated share of estimated abandonment costs could be funded from a portion of the revenues derived from future production, the lessee should be allowed to provide supplemental security on a "pay as you go" basis. Thus, only the capital necessary to provide the required security will be diverted from exploration and production activities.

4. No Assignor Liability

The effect of MMS approval of assignment of the assignor's entire record title interest in a lease is that the assignor is not liable for any plugging and abandonment obligations for which actual performance is not then required in connection with that lease at the time of the assignment approval. Any plan which does not incorporate this element will have a chilling effect on future assignments of OCS leases.

5. Royalty Rate Reductions

The MMS should encourage applications for royalty rate reductions on existing leases with declining production or with an economically marginal reserve base in order to maximize the recovery of reserves. Such applications would be facilitated by establishing clear rules and procedures for granting a royalty rate reduction. In many cases, the effect of such a program would allow the economic limit of a lease to be extended, thus resulting in an economic benefit to the government since the reduced royalty would be collected on the increased production/recovery.

It is important to recognize that many producing properties are good candidates for royalty reduction, and it is recommended that a mechanism for such reductions be developed as a source for funding lease or company-specific escrow or trust funds.

6. Clear Definition and Disclosure

As suggested above, a contributing factor to the OCS lease plugging and abandonment problem is the perceived unreasonableness and inconsistent application of current MMS procedures due to a lack of understanding by the oil and gas industry of such procedures. The recommendations contained in the Committee's plan should be developed by the MMS and industry to a point that the plan may be announced and implemented as governing the rights and obligations of all parties.

V. SUMMARY

The Committee has considered the OCS plugging and abandonment problem, current related MMS practice and proposals and other available alternatives in developing the recommended plan set out in this report. It is recognized that this recommended plan is general in nature and that some of its elements may require further definition in order to address specific concerns of the MMS and the oil and gas industry. The Committee would welcome the opportunity to work with the MMS in order to finalize this recommended plan in a manner responsive to all such concerns.

EXHIBIT A

AVERAGE ABANDONMENT COSTS AT TODAY'S COMPETITIVE MARKET

	0-50' WD	50-100' WD	100-200' WD	200-300' WD
CAISSON	125	185	---	---
LEAN-TO	250	325	450	---
TRIPOD	300	400	625	850
4-PILE	375	475	800	1100
6-PILE	500	650	1050	1425
8-PILE	600	800	1300	1800

Note:

1. Average of all "minor structures" in all water depths, including Caisson, Lean-To, Tripod, 4-Pile, 6-Pile, and 8-Pile equals $431,980 per structure. Similarly, the average of all "major structures" in all water depths, 6-Pile and 8-Pile structures equals $1,015,625 per structure.
2. Does not include well abandonment or site clearance.

American Petroleum Institute
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Dallas, TX 75202-3904
214-748-2328

Gerald A. Schanke
Production Director

December 10, 1992

Mr. Harold L. Cargol, Jr.
Chairman, Joint Association Ad Hoc Committee on
OCS Lease Abandonment and Bonding Issues
Texaco Exploration & Production Inc.
P.O. Box 60252
New Orleans, Louisiana 70160

Dear Mr. Cargol:

On behalf of Larry L. Smith (Shell), the Chairman of the Operating Committee of the API General Committee of Exploration & Production, I am hereby forwarding the American Petroleum Institute's endorsement of the Joint Association Final Committee Report on OCS Lease Abandonment and Bonding Issues. We support the overall report as presented as it provides a significant improvement in the framework of changing Minerals Management Service (MMS) regulations governing OCS lease surety and abandonment bonding requirements.

While there remain some outstanding concerns regarding how the MMS ultimately addresses the lease bond requirements for non-operators holding a record title interest, and the supplemental bonding exemption criteria, we believe that this complete report package sets the proper course for the continuing MMS rulemaking activity. It is imperative that existing practices be improved in ways that will benefit all parties to OCS activities in minimizing risks of defaults while encouraging an open and competitive market for the transfers of OCS properties.

Sincerely,

G. A. Schanke

cc: S. P. Chamberlain
R. L. Jones
L. L. Smith
Paul Teague

INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA

1101 SIXTEENTH STREET, N.W.
WASHINGTON, D.C. 20036
(202) 857-4722

MARK K. SEIFERT
VICE PRESIDENT
REGULATORY AFFAIRS
(202) 857-4738

MEMORANDUM

December 10, 1992

FROM: Mark K. Seifert

TO: Harold L. Cargol, Jr., Chairman,
Joint Association Ad Hoc OCS Lease Abandonment and
Bonding Issues Group

RE: Comments on Final Committee Report

Thank you for forwarding the November 25 memorandum and Final Committee Report of the Joint Association Ad Hoc OCS Lease Abandonment and Bonding Issues Group (Committee) for our review. The Independent Petroleum Association of America (IPAA) submits the following comments for your consideration.

As you know, Outer Continental Shelf (OCS) lease assignments by majors to smaller companies have been increasing. The federal government claims it has experienced losses of about $25 million in abandonment and site clearance costs resulting from business failures by assignees. In January 1990, the Minerals Management Service (MMS) proposed (but never finalized) new rules increasing the bonding requirement for OCS leases from $50,000 per lease or $300,000 for an area-wide bond (covering all leases in an OCS region) to $200,000 per lease or $1,000,000 for an area-wide bond covering exploratory drilling. Additional bond coverage of $500,000 and $3,000,000 respectively would be required at the lease development and production stage.

There are currently about 1,000 lease assignments pending in the Gulf of Mexico that are in limbo because of questions involving the bonding requirements. MMS is attempting to develop a regulatory response which will permit the assignments to proceed and insure against further losses by the federal government in connection with the financial inability of assignees to perform required abandonment and site clearance measures.

The Final Committee Report is a very credible effort of which the Committee should be justifiably proud. With a few exceptions, IPAA believes that the suggestions contained in the Final Report are in the best interests of the industry and will result in a more efficient and manageable oil and gas lease acquisition, exploration, and production on the OCS. Therefore, IPAA offers these comments with respect for the difficulties which have been overcome by the Committee and mindful of the ultimate goal of establishing a workable system through which both large and small producers will be permitted adequate opportunities to explore the OCS. Many larger companies are dedicating a greater proportion of their investment dollars into foreign operations than ever before. Therefore, it is essential to the country's energy security and to the well being of our domestic exploration and production industry that the conditions established by MMS for OCS lease assignment, abandonment, and bonding be established with the needs of independent, primarily small, privately-held, producers in mind.

There are certain aspects of the Final Report which, if adopted by MMS, will inhibit the transfer of lease title to the independents. First, and most important, is the endorsement (on pages 7 and 8 of the Final Report) of the increased bonding requirements proposed by MMS. While it is true that the standard lease and area-wide bonding requirements have been fixed at $50,000 and $300,000 respectively for some time, it is not true that "All segments of the industry seem to be in agreement that the bond amounts should be increased...in accordance with the MMS' recent proposal." In fact, IPAA is very concerned that a drastic increase in bonding levels such as that proposed by MMS and endorsed by the Final Report will inhibit opportunities for the financially secure smaller companies on which much of our industry's future OCS activity arguably depends.

The proposed increases are excessive, burdensome, unreasonable, and will significantly and adversely affect small entities and inhibit exploration and production on the OCS. MMS proposes to increase the individual lease bonding requirements from $50,000 up to $500,000, depending on the stage of development, and increase the area-wide bond from $300,000 to $3,000,000. Even though IPAA agrees that some increase in the bonds may be appropriate, this proposal would increase the bonding requirements by ten times. That is too much and the impact on small entities would be severe.

At a minimum, IPAA requests that the Final Report be amended to provide an alternative which would endorse a more limited increase in the bonding requirements than MMS has proposed. Increasing the bonds to $100,000 for individual leases and to $1,000,000 for area-wide coverage would double and more than triple, respectively, the existing bonding requirements and should provide MMS with adequate assurances of financial reliability. In any event, the Committee should stipulate that any increases that are ultimately adopted should be phased-in over a period of not less than three years to minimize the impact on small entities. Otherwise, the increased bonding requirements could force small entities to sell their interests in existing leases and make them less likely to attempt to acquire additional OCS lease rights -- the opposite of what MMS should be doing, i.e. encouraging independents to explore the OCS.

Second, IPAA does not agree with the paragraph on page 8 of the Final Report that states:

> Additionally, the MMS' apparent practice of requiring only designated operators, but not non-operating record title interest holders, of an OCS lease to obtain a leases or area-wide should be revised to be consistent with applicable regulations which require such a bond to be posted by all co-lessees with a record title interest. A lease or area-wide bond should be required of every lessee holding a record title interest as a threshold criteria [sic] for holding such an interest in an OCS lease or leases. However, the current practice of relieving a non-operating lessee from posting a lease or area-wide bond should be retained in the event that the operator or the affected co-lessee waives this requirement.

This idea is objectionable for a number of reasons: 1) Non-operating co-lessees have been considered exempt by MMS. What are the "applicable regulations" which the Committee believes "require" a separate lease or area-wide bond for non-operating record title holders? 2) If MMS is interpreting their own regulations to require bonds only from operating lessees, why should the producing industry volunteer to subject non-operating lease interest holders to this requirement? 3) Whether or not the operator is compensated by other record title holders is a matter which is appropriately addressed in the operating agreement. It is not an appropriate matter for MMS to mandate. 4) Non-operating lessees have made investments based on their exempt status. MMS should not be encouraged to automatically and retroactively shift these exempt co-lessees into the non-exempt category. 5) Even if the Committee believes that it is appropriate that some exempt, non-operating owners should be required to post bonds, the more moderate approach should be that these currently-exempt parties will continue to be considered exempt unless and until the operator makes the affirmative and justified determination that they should no longer be considered exempt. 6) Lastly, even if it were appropriate to reclassify these previously exempt, non-operating interest owners, the change should be made prospectively only, i.e. for interests acquired after the effective date of the new rules. Even then, it is still a bad idea and will make it harder for small companies to participate in OCS exploration and production.

Based on the comments I have received from IPAA members, these are the only two areas where IPAA requests changes in the Final Report. The remainder of the document contains very well thought-out and appropriate responses to a vexing problem for the government and the industry. IPAA congratulates you and the Committee and looks forward to assisting the Committee further in any way that we can. Please contact me if I can answer any questions. Thank you.

cc: G.A. Schanke, Director, Exploration and Production, API
Robert B. Stewart, President, National Ocean Industries Association
Richard A. Fitch, Executive Director, Offshore Operators Committee
Joint Association Ad Hoc OCS Lease Abandonment and Bonding Issues Group

NOIA

National Ocean Industries Association

Robert B. Stewart
President

December 7, 1992

Harold L. Cargol
Division Landman
Offshore Exploration Division
Texaco Exploration and Production, Inc.
400 Poydras Street
New Orleans, Louisiana 70130

Dear Harold:

I have examined the report of the Ad Hoc Lease Abandonment and Bonding Issues Committee. While some may take issue with certain parts of the report, it is, on the whole, an excellent piece of work. You and the members of your committee are to be commended for this outstanding effort. Whatever quibbles one might have, the recommendations in the report represent a vast improvement over the MMS proposal that gave rise to this effort in the first place.

The National Ocean Industries Association endorses the report and will cooperate in urging its consideration by MMS.

Sincerely,

Robert B. Stewart

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SPORT FISHING INSTITUTE

ARTIFICIAL REEF DEVELOPMENT CENTER

1010 Massachusetts Avenue, N.W. (Suite 320), Washington, D.C. 20001 (202) 898-0770

September 16, 1993

The Honorable Thomas J. Manton
Chairman
Subcommittee on Fisheries Management
Room 513
Ford House Office Building
Washington, D.C. 20515

Dear Chairman Manton:

I would like to thank you again for the opportunity to testify at the hearing on site clearance and the "Rigs-to-Reefs" program in the Gulf of Mexico on Tuesday, June 29, 1993. Enclosed, per your request, are my responses to the questions you submitted to me following the hearing. I responded to only those questions where I felt I was most qualified to answer.

Also enclosed is some additional material that I thought would be of interest to you. If you have any additional questions or require further assistance, please feel free to contact me.

Sincerely

Tina Berger

Tina Berger
Director

Enclosures

QUESTIONS FROM CHAIRMAN MANTON

(1) What safeguards are in place to prevent damage to fishing gear?

(2) How often is fishing gear entangled in sunken oil rigs?

(3) Do reefs increase productivity or merely concentrate populations of aquatic organisms?

(4) What other artificial reefs projects are being undertaken by the various coastal states?

(5) What are the cumulative impacts of these and other artificial reefs being installed by coastal state fishery programs?

(6) Who benefits most from this program: the oil and gas industry or the fishing industry?

(7) Do some sectors of the fishing industry benefit at the expense of others sectors of the fishing industry?

(8) What are the differences in the Texas and Louisiana programs and which program most benefits the fishing industry?

(9) Have any environmental impacts been documented for the ongoing "Rigs-to-Reefs" program?

(10) How serious is the threat of environmental contamination from traces of oil that may be associated with these structures?

(11) Can converted rigs be moved by hurricanes, tropical storms, or normal ocean currents?

RESPONSES FROM TINA BERGER

(1) You should refer to representatives from the commercial fishing industry as well as the artificial reef managers in both Texas and Louisiana, who are Hal Osburn and Rick Kasprazak, respectively. Their addresses and telephone numbers are:

Hal Osburn
Director, Fisheries Harvest Programs
Texas Parks and Wildlife Department
4200 Smith School Road
Austin, Texas 78744
Phone: (512) 389-4863

Rick Kasprazak
Louisiana Department of Wildlife and Fisheries
P.O. Box 98000
Baton Rouge, Louisiana 70898-9000
Phone: (504) 765-2375

(2) You should refer to the individuals listed in response #1.

(3) This question has been hotly debated by researchers for almost 20 years, and still remains largely unresolved to this day. For the most part, studies suggest that the ability of an artificial reef to aggregate or enhance production of fishery resources depends upon a number of variables, including: the reef material, the availability of nearby natural habitat, resident fish species, depth and temperature. There is evidence which suggests that some artificial reefs enhance local production, while others merely serve as a point of aggregation (see Attachment 1).

The information that is available on converted oil and gas structures suggest that these structures provide both functions, depending upon species type. For example, for certain habitat-dependent species, such as grouper, snapper, and red drum, it is believed that artificial reefs help to enhance the production or, more appropriately, the survival of these species. For these species artificial reefs provide an important source of food, refuge, spawning and rearing habitat. For other fish such as pelagic, schooling or nomadic species (e.g., mackerel, tuna, shark), artificial reefs, in this case obsolete oil and gas structures, provide: spatial references for orientation in an otherwise featureless environment, and areas where fish can hide from predators, rest and conserve energy.

Perhaps a more relevant question is not whether artificial reefs aggregate or produce fishery resources, but what fish species does a specific artificial reef material select for and what fishery needs does the reef meet?

(4) Nearly almost every U.S. coastal state has undertaken some form of artificial reef development. There are more than 670 permitted artificial reefs located in U.S. coastal waters.

Along the Atlantic coast, 11 states have active artificial reef programs. These states are: Delaware, Georgia, Florida*, Maryland, Massachusetts, New Jersey*, New York*, North Carolina*, Rhode Island, South Carolina* and Virginia. Those states marked with an asterisk implement their programs through an adopted State Artificial Reef Plan. Delaware, Maryland, Rhode Island and Virginia are in the process of developing their artificial reef plans. The primary intent of the state plans and programs are to improve and enhance fishery habitat and fishing opportunities (for both commercial and recreational interests), while minimizing user group conflicts. The primary materials used by the Atlantic coastal states in reef construction are composed of obsolete vessels; concrete, rock and rubble, and tires.

Gulf-wide, all the coastal states have active artificial reef programs. Texas, Louisiana and Florida have state adopted plans. Mississippi is in the process of developing a state plan. Alabama has an unique program in which the state has set aside two large general permit areas, covering over 3,000 square miles of sea floor. All artificial reef development whether private or state driven occurs within these two areas. For more information regarding Alabama's program, contact: Walter Tatum, Alabama Department of Conservation and Natural Resources, Division of Marine Resources, P.O. Box 458, Gulf Shores, AL 36542; (205) 968-7576.

The primary intent of the state plans and programs are to improve and enhance fishery habitat and fishing opportunities (for both commercial and recreational interests), while minimizing user group conflicts. The primary reef materials used in the Gulf of Mexico are: obsolete oil and gas structures, obsolete vessels, concrete and shell.

Along the Pacific coast, Washington, Oregon and California are involved in artificial reef development and management. California is the most involved, having adopted and implemented a state plan in November 1990. Unlike the Atlantic and Gulf regions where a large percentage of reefs are located in offshore waters (beyond 3 miles), the Pacific states conduct most of their reef development in nearshore waters. In addition, the primary focus of the artificial reefs is to enhance nearshore habitat and improve recreational fishing opportunities. The primary reef materials used in this region are composed of rock and rubble.

Hawaii also has an active artificial reef program. The intent of which is fish aggregation and production (both commercial and recreational). Unlike the other coastal states, Hawaii extensively use fish aggregating devices (FAD) as their primary artificial reef material. As implied by the name, FADs are used primarily to aggregate pelagic fish (such as tuna, mackerel and billfish) so that they can be caught with greater efficiency.

(5) There have been no assessments conducted on the cumulative impacts of artificial reefs to the marine environment. Studies that have been conducted usually span a fairly short time period (1 - 4 years) or are conducted on individual reef sites or reef complexes.

(6) They mutually benefit.

(7) I would contend that all fishery user groups benefits from increases in much-needed fishery habitat. Some user groups, such as shrimpers, may be impacted in that they cannot fish in on or around artificial structures because of gear entanglement concerns. However, this can be accounted for with proper planning and siting of artificial reefs.

(8) In many ways the Texas and Louisiana Artificial Reef Programs are very similar. They use similar materials, deal with similar user groups, and have similar fishery and habitat concerns. Louisiana's Program differs from Texas' in that eight artificial reef planning areas were developed from the outset of the program with significant public and user group input. Any artificial reef development that occurs off Louisiana's coast occurs within these planning areas. In Texas planning occurs site by site. Each time a new site is proposed by the Department, they must apply for a permit with the Army Corps of Engineers and go through public review.

(9) To date, there have been no environmental impact studies conducted on the conversion of obsolete oil and gas structures into artificial reefs, although there have been several Environmental Impact Statements (EIS) conducted on oil and gas structures still in production. Most of these studies have been conducted either by the oil and gas industry or the Minerals Management Service.

There is no formal mechanism under NEPA which requires the development of an EIS for "Rigs-to-Reefs." Informally, when the Army Corps of Engineers obtains a request by a state to permit an artificial reef, the Corps forwards the request to the Environmental Protection Agency (EPA) who determines whether an EIS is required. To date, EPA has not requested the development of an EIS for any permitted artificial reef.

(10) I would refer you to representatives from the oil and gas industry.

(11) There have been some cases where artificial reefs composed of both large vessels and converted oil and gas structures have moved as a result of hurricanes and other intense storm events, although it is a fairly rare occurrence. The likelihood of their moving increases as water depths become more shallow and wave energy increases.

\tlb\srdc correspondence disk #3\q&a

SPORT FISHING INSTITUTE

ARTIFICIAL REEF DEVELOPMENT CENTER

1010 Massachusetts Avenue, N.W. (Suite 320), Washington, D.C. 20001 (202) 898-0770

September 16, 1993

The Honorable Solomon P. Ortiz
Chairman
Subcommittee on Oceanography, Gulf of Mexico
and the Outer Continental Shelf
Room 575
Ford House Office Building
Washington, D.C. 20515

Dear Chairman Ortiz:

I would like to thank you again for the opportunity to testify at the hearing on site clearance and the "Rigs-to-Reefs" program in the Gulf of Mexico on Tuesday, June 29, 1993. Enclosed, per your request, are my responses to the questions you submitted to me following the hearing.

Also enclosed is some additional material that I thought would be of interest to you. If you have any additional questions or require further assistance, please feel free to contact me.

Sincerely

Tina Berger
Director

Enclosures

QUESTIONS FROM CHAIRMAN ORTIZ

(1) Advocates of "Rigs-to-Reefs" have presented a lot of information about the value of these structures in terms of improved productivity. What is the relative value of these artificial reefs to the overall production of the Gulf of Mexico fishery resources? Are there any trade-offs?

(2) In terms of the environmental effects of converting oil and gas structures to artificial reefs, have there been any detailed environmental studies done to date? Are Environmental Impact Statements required by the National Environmental Policy Act (NEPA) for "Rigs-to-Reefs"?

(3) To what degree is the high number of fish found in association with rigs due to aggregation rather than enhanced production? How does this effect Gulf fisheries?

RESPONSES FROM TINA BERGER

(1) There are currently no studies which measure or assess the relative value of artificial reefs to the overall production of the Gulf of Mexico fishery resources. However, there are estimates which suggest that artificial reef habitat in the Gulf of Mexico provides an additional 78 to 195 percent of habitat in the Gulf (Stanley, personal communication). This is particularly important in a region such as the Gulf where natural hard-bottom substrate (reef material) is at a minimum (~25,000 sq km).

For more information, you may wish to contact David Stanley, a researcher at Louisiana State University (LSU). He can be contacted at LSU, Coastal Fisheries Institute, Baton Rouge, LA 70803; (504) 388-6284.

(2) To date, there have been no environmental impact studies conducted on the conversion of obsolete oil and gas structures into artificial reefs, although there have been several Environmental Impact Statements (EIS) conducted on oil and gas structures still in production. Most of these studies have been conducted either by the oil and gas industry or the Minerals Management Service.

There is no formal mechanism under NEPA which requires the development of an EIS for "Rigs-to-Reefs." Informally, when the Army Corps of Engineers obtains a request by a state to permit an artificial reef, the Corps forwards the request to the Environmental Protection Agency (EPA) who determines whether an EIS is required. To date, EPA has not requested the development of an EIS for any permitted artificial reef.

(3) This question has been hotly debated by researchers for almost 20 years, and still remains largely unresolved to this day. For the most part, studies suggest that the ability of an artificial reef to aggregate or enhance production of fishery resources depends upon a number of variables, including: the reef material, the availability of nearby natural habitat, resident fish species, depth and temperature. There is evidence which suggests that some artificial reefs enhance local production, while others merely serve as a point of aggregation (see Attachment 1).

The information that is available on converted oil and gas structures suggest that these structures provide both functions, depending upon species type. For example, for certain habitat-dependent species, such as grouper, snapper, and red drum, it is believed that artificial reefs help to enhance the production or, more appropriately, the survival of these species. For these species artificial reefs provide an important source of food, refuge, spawning and rearing habitat. For other fish such as pelagic, schooling or nomadic species (e.g., mackerel, tuna, shark), artificial reefs, in this case obsolete oil and gas structures, provide: spatial references for orientation in an otherwise featureless environment, and areas where fish can hide from predators, rest and conserve energy.

Perhaps a more relevant question is not whether artificial reefs aggregate or produce fishery resources, but what fish species does a specific artificial reef material select for and what fishery needs does the reef meet?

ATTACHMENT 1

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ARE HIGH DENSITIES OF FISHES AT ARTIFICIAL REEFS THE RESULT OF HABITAT LIMITATION OR BEHAVIORAL PREFERENCE?

James A. Bohnsack

ABSTRACT

Rapid colonization, high fish densities, and high catch rates at artificial reefs have been used as evidence for habitat-limitation and increased production of reef fishes. An alternative hypothesis is that artificial reefs attract fishes due to behavioral preferences but do not increase reef fish production or abundance. Reviewed literature reveals that except in one case evidence for increased production is mostly anecdotal and inadequate. Attraction and/or production by a particular artificial reef is predicted to depend on the species and individual ages (size) of reef fish, and on reef location. Factors predicted to be important are natural reef availability, mechanisms of natural population limitation, fishery exploitation pressure, life history dependency on reefs, and species-specific and age-specific behavioral characteristics. Increased production is most likely at locations isolated from natural reefs, and for habitat-limited, demersal, philopatric, territorial, and obligatory reef species. Attraction should be more important in locations with abundant natural reef habitat; where exploitation rates are high; and for recruitment-limited, pelagic, highly mobile, partially reef-dependent, and opportunistic reef species. Artificial reefs are unlikely to benefit heavily exploited or overfished populations without other management actions.

Artificial reefs are used in fisheries to create fishing opportunities, reduce user conflicts, save time and fuel, reduce fishing effort, make locating fish more predictable, increase public access and safety by deployment near ports, and increase fish abundance at deployment sites by attracting dispersed fishes and producing new fish biomass (Stone, 1985; National Academy Press, 1988).

Questions persist, however, about the importance of artificial reefs for producing new fish biomass versus attracting and aggregating fishes from surrounding areas without increasing total biomass (Bohnsack and Sutherland, 1985; Munro and Williams, 1985; Solonsky, 1985; Bohnsack, 1987; National Academy Press, 1988). The resolution of this controversy has important implications for fisheries management. Artificial reefs that produce significant new biomass may be useful for increasing fishery resources. However, artificial reefs that act primarily by attraction may promote overfishing under heavy fishing pressure by increasing fish catchability (the proportion of the population removed by one unit of effort). Fishes normally dispersed over a wide area would be concentrated and possibly depleted more rapidly (Samples and Sproul, 1985).

An underlying rationale for artificial reef deployment is the production hypothesis: that artificial reefs provide additional critical habitat that increases the environmental carrying capacity and eventually the abundance and biomass of reef fishes. Barren, unproductive substrate is turned into a highly productive environment (Stone et al., 1979). Mechanisms suggested for this transformation include (1) providing additional food, (2) increasing feeding efficiency, (3) providing shelter from predation, (4) providing recruitment habitat for settling individuals that would otherwise have been lost to the population, and (5) indirectly, because fishes moving to artificial reefs create vacated space in the natural environment that allows replacement from outside the system (Randall, 1963; Ogawa, 1973; Stone et al., 1979; Matthews, 1985).

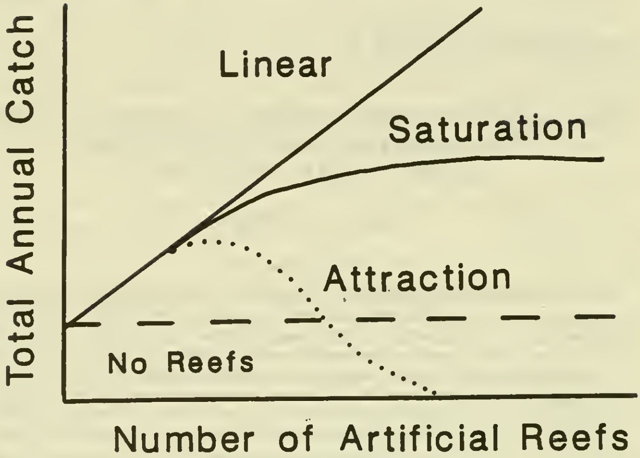

Figure 1. Predicted effects of the attraction and production hypotheses on catch. The production hypothesis predicts increased catch as some function of the amount of deployed reef material (solid lines). The attraction hypothesis (dotted line) predicts an initial increase in catch followed by stock depletion and decline to levels below ambient catch without artificial reefs (dashed line). See text for details.

An alternative attraction hypothesis is that artificial reefs attract fishes as the result of behavioral preferences but do not significantly increase total fish biomass.

Possible effects of the production and attraction hypotheses on catch are illustrated (Fig. 1). The production hypothesis predicts that biomass production and catch will increase as some function of the amount of material deployed. Possibilities include direct linear or saturation functions. Saturation results when reef resources no longer limit populations so that constructing additional reefs does not further increase production. The attraction hypothesis predicts as a worst case an initial increase in catch followed by a decline to levels below what existed without artificial reefs. Total catch should eventually fall because of depletion due to increased catchability. However, higher total catch may be sustained under the attraction hypothesis if replacement occurs from a large stock of migratory individuals (not illustrated).

A better understanding of the relative importance of attraction and production is critical for wise fisheries management and the effective construction and deployment of artificial reefs. Although the controversy has been recognized for a long time, progress toward resolving it has been slow. Here I attempt to elucidate the controversy and facilitate its resolution by recasting it into a theoretical and testable framework.

METHODS

I reviewed the relevant scientific literature emphasizing reef fish ecology, population limitation, behavior, and effects of artificial reefs on fish populations. Some described behavioral attraction mechanisms have not been tested on fishes although examples using fish were cited where possible. Based on the review I predicted conditions under which attraction (reefs primarily aggregate fishes without necessarily increasing biomass) or production (reefs increase biomass by providing shelter or food for resource-limited populations) should operate. Existing data and experimental approaches for testing the relative importance of attraction and production are discussed.

Reefs were broadly defined to include true coral reefs, rock outcroppings, wrecks, fish aggregating devices (FADs), oil production platforms, breakwaters, and other artificial structures. For this paper reef fishes include any fish frequently associated with natural or artificial reefs. Recruitment was defined as the process of larval settlement and post-settlement survivorship to initial census observation (Richards and Lindeman, 1987). Production was defined as the net increase in fish biomass, not harvest rate or harvest quantity (Bohnsack and Sutherland, 1985). Growth overfishing was defined as the process of harvesting fishes before they have had a chance to put on weight; recruitment overfishing was defined as the process of reducing adult stocks to a point where recruitment fails from a lack of sufficient larvae (Cushing, 1973).

RESULTS

Reef Fish Ecology

Life History.—Reef fish biology and fisheries have been reviewed by Sale (1980), Huntsman et al. (1982), Munro (1983), Polovina and Ralston (1987), and Richards and Lindeman (1987). Almost all reef fishes have a planktonic larval dispersal phase that lasts from weeks to months (Sale, 1980; Brothers et al., 1983; Victor, 1986b). Many reef fishes are sedentary; after their young settle directly on reefs, they remain there for the rest of their lives. Many commercially and recreationally important reef fishes such as lutjanids, serranids, haemulids and sphyraenids settle in other habitats before moving to a reef (Starck, 1968; 1970; Moe, 1969; Shulman and Ogden, 1987). Obligate reef species require reef habitat while opportunistic species may use reefs as well as other habitats. Some species move off a reef daily to feed in surrounding areas (reviewed by Helfman, 1986). Many commercially and recreationally important reef fishes are characterized by long life, slow growth, low natural mortality, and high reef fidelity (Huntsman, 1981; Manooch, 1987). Factors generally considered most likely to limit adult population size are habitat, larval supply (recruitment), and fishery exploitation (Sale, 1980; Richards and Lindeman, 1987).

Habitat Limitation.—The belief that animal populations exist close to the carrying capacity of an environment is well established in ecological literature (MacArthur, 1972), especially for more stable environments (Menge and Sutherland, 1976). Reef fish abundance has traditionally been considered limited by habitat or space partly because reefs are a patchy resource, limited in geographical coverage and separated from other reefs. Sale (1980) noted a widespread assumption that the number of larvae able to settle on natural reefs was in excess of the resources available after settlement. Competitive interactions among individuals was thought to determine abundance on a reef (Sale, 1980; Munro and Williams, 1985), and scarcity of reefs limited sustained fishery yields (Huntsman, 1981).

Habitat is thought to be limiting primarily by availability of food or shelter from predation. Shelter is generally considered more important (Sale, 1980) although proximity of food in sea grasses and plankton availability may limit some fish populations (Randall, 1963; Glynn, 1973). Shulman (1984) found that food availability did not directly influence settlement or early survivorship. Ross (1986) suggested, however, that food limitation was more important than generally recognized based on evidence that trophic resource partitioning was more important than habitat partitioning among temperate and possibly tropical marine reef fish assemblages. Richards and Lindeman (1987) noted that food shortage can be difficult to show because starvation and slower growth interact with predation.

Predation has been shown to be an important source of mortality especially among newly settled juveniles (Shulman, 1984; Doherty and Sale, 1986; Shulman and Ogden, 1987). Shulman (1984) found shelter site availability limited recruitment and/or early survivorship presumably through its effects on predation rates. Hixon and Beets (1989) showed inverse relationships between prey and predator abundance influenced by shelter availability.

Sale (1980) concluded that space-limited assemblages existed but were less general than previously claimed. Out of four studies claiming a relationship between species richness and topographic complexity, only two (Risk, 1972; Luckhurst and Luckhurst, 1978) demonstrated such a relationship (primarily for sedentary species). Sale (1980) noted that four lines of evidence were used to support the importance of topographically structured space-limitation for reef fishes: (1) the very rapid colonization of artificial reefs and denuded natural reefs; (2) faster recruitment to empty versus occupied natural and artificial reefs; (3) conspicuous interspecific territorial defenses; and (4) constancy of numbers in some sites and microhabitats. Sale rejected the constancy of numbers as evidence after noting many reports of wide variations of fish abundance, even by authors concluding persistence of fish assemblages. Bohnsack (1983) showed that the appearance of constancy could be an artifact of the time interval between censuses.

Sale (1980) concluded that competitive and predatory responses by resident fishes did not always influence recruitment rates. Munro and Williams (1985) concluded that with the exceptions of Sale (1976) and Shulman et al. (1984), most studies found either no recruitment inhibition or enhanced recruitment by resident populations. Shulman (1985b) concluded that spatial patterns of recruitment interacting with predation may influence population abundances and species composition of reef fishes. Sweatman (1985) found high resident fish densities reduced larval recruitment by other fish species but this response was not related to resource availability. Jones (1987) found for one damselfish that juvenile density or adult presence had substantial effects on growth and maturation but not on juvenile survivorship.

Recruitment Limitation.—Although research in the 1970's tended to assume that availability of demersal resources was limiting to adult populations, studies in the 1980's have demonstrated the importance of recruitment-limitation; larval survival, dispersal, or settlement survivorship may limit adult populations (Sale, 1980; Munro and Williams, 1985; Richards and Lindeman, 1987). Indirect evidence of recruitment limitation includes large spatial and temporal variation in recruitment and adult population size that could not be explained by differences in reef structure (Munro et al., 1973; Sale, 1980; Sale et al., 1984; Munro and Williams, 1985; Shulman, 1985a; Doherty, 1987).

Three lines of direct evidence show the importance of recruitment limitation as opposed to resource limitation in controlling adult population size. First, the lack of density-dependent post-settlement mortality (Doherty, 1982b; Victor, 1983; 1986a) indicates competition or predation may not be as important as larval supply. Second, a shortage of competent larvae can keep reef fish populations below the levels at which the supply of food and space limits population sizes for damselfish (Williams, 1980; Doherty 1982a; 1982b; 1983) and wrasses (Victor, 1983; 1986a; 1986b). Third, greater benthic resources did not increase damselfish abundance (Wellington and Victor, 1985) nor have artificial reefs increased regional reef fish production (Munro and Williams, 1985).

In opposition, Shulman and Ogden (1987) predicted that mortality of post-settlement juveniles would have a much stronger influence on adult population abundance than proportionately equivalent changes in recruitment rate, particularly for species with high natural mortality rates. Recruitment limitation was predicted to be more important for species with low natural mortality. They found that postsettlement mortality had a stronger influence on adult population size than proportionately equivalent changes in recruitment rates for two out of three species for which recruitment limitation had been demonstrated. Also, causes of population limitation can change over time (Wiens, 1977; Ross, 1986). Artificial reefs could increase production of species that are not normally habitat-limited during "environmental crunches" where unusual environmental conditions or extremely good recruitment years increase competition and habitat limitation.

Fishery Exploitation. — Fishery exploitation can be a significant factor in limiting adult population size, especially for long-lived species (Cushing, 1973; Gulland, 1977). Overfishing of tropical reef resources, in particular, has now been documented as a widespread problem (Pauly and Murphy, 1982; Munro, 1983; Appledoorn and Lindeman, 1985; Bohnsack, in press). Surplus production models (Ricker, 1977) predict that the standing stock biomass will be around half of its unexploited value for fisheries operating at the maximum sustained yield (MSY). Biomass should be less for overfished stocks. Samples and Sproul (1985) modeled FAD fisheries and concluded that unregulated, low-cost, efficient fishing effort near fish aggregators could deplete stocks and reduce gross fishery revenues.

Behavioral Studies

Behavioral studies have shown mechanisms applicable to the attraction of reef fishes to artificial reefs. Many fishes tend to orient and position themselves in size-specific and species-specific ways to structure and light (Abel, 1962; Ogawa, 1968; Grove and Sonu, 1985). The most basic mechanisms are instinctive orientation responses (taxes or kinesis) to structure or current and thigmotropic responses (contact with objects) (Breder and Nigrelli, 1938; Ogawa, 1968). Helfman (1979) showed that fishes may move to shade because they can better see objects in surrounding sunlit waters, such as approaching predators or prey. Some fishes may use structure for orientation and navigation purposes without directly obtaining food or shelter (Bohnsack and Sutherland, 1985). Curiosity may be important for some species. Mice have been shown to spend considerable time exploring novel, structurally complex environments that are unlike their home environment (Berlyne, 1966). Structural complexity of artificial reefs may also moderate predation by providing more refuges and thus decrease the foraging efficiency of predators (Menge and Sutherland, 1976; Rosenzweig and MacArthur, 1963; Ware, 1972; Hixon and Beets, 1989).

Reef fishes have been shown to select habitats and to change habitat requirements with age (Sale, 1968; 1969; Starck, 1970). Sale (1969) predicted that fishes will accumulate in preferred habitats through a process of appetitive exploration, where fishes in adequate environments will spend little time explorating new environments while fishes in less adequate environments will spend more time exploring new environments. Wecker (1963) showed the accumulations of mice in preferred habitats because individuals moved slower in preferred habitats and speeded up in less preferred habitats.

Predator abundance at artificial reefs has been correlated with prey availability (Ranasinghe, 1981; Kock, 1982; Buckley and Hueckel, 1985). Predators can accumulate in the vicinity of prey by means of "area restricted searching," where predators slow down their normal movements or increase their rate of turning after finding a prey item (Hassell and May, 1974). Thomas (1974) showed that fishes decrease the linear distance traveled after successfully discovering food and increased it after rejecting a food item. This behavior facilitates avoiding the unproductive foraging areas, increasing the chances of discovering productive areas, and remaining in the proximity of discovered food.

Optimal foraging theory (reviewed by Krebs, 1978; Hughes, 1980; Hart, 1986) could also be applied to movements of fishes, especially predators, between reefs. Fishes are predicted to distribute themselves and to move between reefs so as to maximize net energy gain. Fishes should distribute themselves between reefs according to relative reef profitabilities (food intake) (Godin and Keenleyside, 1984). Theories of "marginal value" (Charnov, 1976; Hart, 1986) and "giving up time" (Krebs et al., 1974; Krebs, 1978; MacNair, 1982) predict that predators should leave a reef when the energy yield from food resources is reduced to a certain level. Foragers should spend more time at reefs with abundant food resources than at reefs with low food availability. Model predictions may be modified to account for unequal foraging and learning abilities, risks of predation, presence of conspecifics, unpredictability of available food, and the costs and time to travel between patches (Regelmann, 1984; Milinski, 1984; Hart, 1986; Milinski, 1986).

Artificial Reef Studies

Bohnsack and Sutherland (1985) reviewed artificial reef literature and found numerous, well-documented observations of rapid colonization rates, high fish densities, and high catch rates. With few exceptions (Burchmore et al., 1985), fish densities, biomass, and catch rates were often higher on artificial reefs than on natural reefs (see also Buckley and Hueckel, 1985; Matthews, 1985). Fishes often appeared within hours and average numbers of individuals and species often occurred within days, weeks, or months. Observations of fish feeding on and around artificial reefs were common. Nelson (1985) reported that gray triggerfish grew faster at oil production platforms than in natural habitats.

Some evidence shows fish attraction and possibly behavioral preference for artificial reefs. Tagging studies have demonstrated fish movement from natural reefs to artificial reefs (but not vice versa) in Puerto Rico (Fast and Pagan, 1974) and in California (Matthews, 1985; Solonsky, 1985). Buckley and Hueckel (1985) demonstrated the importance of rockfish and ling cod immigration in replacing fishery losses on artificial reefs in Puget Sound.

Munro and Williams (1985) noted there was little evidence showing that artificial reefs increased the total fish production in a given area, despite the fact that numerous artificial reefs had been constructed in many parts of the world. Japanese artificial reef programs, the most extensive in the world, were usually justified based on popularity and economics by comparing the value of the harvest to the cost of building reefs (Grove and Sonu, 1985; Mottet, 1985; Nakamura, 1985; Sato, 1985). Grove and Sonu (1985) concluded that the evidence for increased artificial reef productivity from before and after surveys was far from conclusive, even though dramatically increased landings had been reported from particular areas. Mottet (1985) also concluded that insufficient biological data were available to judge the effectiveness and practicality of many of the Japanese enhancement efforts. Sakai (1982, cited in Kawasaki, 1984) concluded that no significant economic benefits were attributable to the artificial reefs after comparing the fish production value between the 5-year period before and the 10-year period after artificial reef installation off Hokkaido, Japan. Kawasaki (1984) examined data from the first two years after a 5-year installation program in Yuriage Miyagi Prefecture, Japan, and found uncertain economic benefits because artificial reefs attracted some species but repelled others. Polovina and Sakai (1989) showed that artificial reefs in one region increased the production of octopus but only aggregated four flatfish species.

DISCUSSION

Attraction and production are not mutually exclusive and can be considered opposite extremes along a gradient. While artificial reefs may merely attract and concentrate some fishes, they may promote the production of others. Most fishes probably lie somewhere between the two extremes.

Behavioral studies show many mechanisms to explain fish attraction to artificial reefs. However, demonstrating attracting mechanisms does not refute the possibility of increased production. Fish attraction behavior presumably evolved because of some selective advantage (i.e., faster growth, increased survival, and reproduction). The concern here is that artificial reefs may provide cues beyond the evolutionary experience of fishes and elicit responses that are not necessarily adaptive. An analogous example is the concentration of fishes in warm water plumes from power plants (reviewed by Goodyear et al., 1974). Under natural situations, moving to the warmest water may be adaptive, but in power plant plumes fishes may spawn at the wrong time of year or die when the plant is temporarily shut down. Similarly, fishes attracted to artificial reefs may face higher mortality from natural predators (Hixon and Beets, 1989) or fishermen (Matthews, 1985; Solonsky, 1985).

Evidence for the five proposed mechanisms for increasing total biomass production with the addition of artificial reefs is limited and mostly circumstantial:

Artificial Reefs Provide Additional Food.—Many studies have reported observations of fishes feeding at artificial reefs. Added substrate undoubtedly provides additional food but it remains to be shown how much new fish biomass is consequently produced and whether the added biomass is a significant contribution to stock size.

Artificial Reefs Increase Feeding Efficiency.—Improved feeding efficiency implies faster growth rates on artificial reefs than for fishes in natural habitat. This has not been demonstrated on a general basis but has been claimed for one species (Nelson, 1985).

Artificial Reefs Provide Shelter from Predation.—Many studies have reported observations of larvae and juvenile fishes at artificial reefs. This is not sufficient evidence because individuals present do not necessarily survive or make a significant contribution to the population. Shelter from predation implies higher survival at artificial reefs than in natural habitats, which was supported by some experimental studies discussed earlier. The significance of increased survival on total stock sizes remains to be determined.

Artificial Reefs Provide Recruitment Habitat for Settling Individuals that Would Have Been Lost to the Biota Otherwise.—This is difficult to test although Polovina and Sakai (1989) provide some supporting evidence for octopus. To my knowledge no other published data support this possibility.

Artificial Reefs Increase the Production of Natural Reef Environments by Creating Vacated Space.—This mechanism is most applicable to unexploited, habitat-limited populations near their environmental carrying capacity; it is less likely to apply to recruitment-limited, heavily fished or overfished populations. Under these conditions, populations are below carrying capacity, face reduced competition, and are less likely to be habitat-limited. However, artificial reefs may help mitigate natural reef damage or loss due to pollution or other causes.

Some of the proposed mechanisms conflict. For example, increased shelter and survival implies reduced predation. However, additional food and increased predator feeding efficiency suggests higher predation rates and increased prey mortality. Also, benefits from changes in one factor may be counteracted by other factors. For example, increased recruitment can be negated by increased mortality from higher fishing intensity on artificial reefs than on natural reefs (Bohnsack and Sutherland, 1985; Matthews, 1985; Solonsky, 1985).

Experimental Approaches

The best direct evidence proving increased production would be an increased total regional catch or standing stock in proportion to the amount of artificial reef material deposited, while controlling for fishing effort, attraction from surrounding areas, and changes in year class strength. While seemingly difficult, one study discussed earlier (Polovina and Sakai, 1989) has met these criteria and has distinguished between mere attraction and new biomass production.

High fish densities, rapid colonization rates, and high catch rates at artificial reefs are well-documented but are not sufficient evidence to prove increased production or habitat limitation. The attraction hypothesis has fewer assumptions, can explain the same phenomena, and should be refuted before increased production is assumed. Both hypotheses, for example, predict high fish densities at artificial reefs. Claiming that habitat is limiting because of high fish densities (or rapid colonization) is analogous to claiming that warm water is limiting because fishes are attracted to warm water plumes from power plants.

Rapid initial colonization likewise can support either hypothesis, except that large fishes aggregating around artificial reefs within days, weeks, or even a few months is clearly the result of attraction. Initial attraction does not refute, however, the possibility of increased production over longer periods. A delayed response would be expected for fish to recruit and grow (Grove and Sonu, 1985).

Both hypotheses can also explain higher catch rates at artificial reefs. However, excessively high catch rates relative to the standing stock size show attraction is operating (Buckley and Hueckel, 1985). Long-term increased Japanese fish landings after installing artificial reefs has been claimed as evidence for increased production, although this information is not conclusive. With the exception of Polovina and Sakai (1989), results do not show whether increased landings were the result of increased fishing effort (or effectiveness), changes in year class strength, or attraction from other areas. Catches in one region may be at the expense of another region. Also unanswered is whether the increased catches could have been made without building artificial reefs.

Determining the importance of attraction and production will require very careful monitoring and assessment of artificial reefs with careful attention to catch rates, fishing effort, species composition, standing stock abundance, recruitment, age composition, growth, and turnover rates. Detailed information about the biology and natural history of resident species would be helpful.

Some indirect evidence supporting increased production by artificial reefs would be provided by experimentally demonstrating the existence of the hypothesized production mechanisms discussed earlier, such as increased growth rate or better survival at artificial reefs. Documenting food web relationships and energy budgets could demonstrate the potential of increased production, especially for food limited systems. Polovina (1984) provided a possible model which estimates mean annual biomass, production, and consumption for ecosystem components. The importance of attraction could be shown by tagging studies, high fishery removal rates relative to standing stock size, and rapid colonization by larger fishes.

Predicted Important Gradients

Based on reviewed literature, I predict several gradients should be important for artificial reef attraction or increased production. These gradients are: natural reef availability, mechanisms of natural population limitation, exploitation pressure, life history dependency on reefs, and species-specific and age-specific behavioral characteristics (Fig. 2). Increased production is most likely at locations isolated from natural reefs; and for habitat-limited, demersal, philopatric, territorial, and obligatory reef species. Attraction should be more important in locations with abundant natural reef habitat; where exploitation rates are high; and for recruitment-limited, pelagic, highly mobile, partially reef-dependent, and opportunistic reef species. Each gradient is discussed below.

Reef Availability.—Munro and Williams (1985) asked whether recruits to artificial reefs would have survived in available natural habitat. I predict artificial reef production should be more important for reef dependent species in locations more isolated from reef habitats. Here potential larval recruits would undoubtedly die if no reef habitat was within range. The proportion of recruits finding suitable habitat should increase with greater habitat availability. Also, species that feed away from reefs are more likely to find unexploited foraging areas in locations isolated from other reefs. Increased production by opening up new foraging areas should be less important with high reef density because surrounding areas are more likely to be exploited by residents of other reefs.

Predictions from behavioral models suggest that fish attraction should be favored at locations with high natural reef availability. Fishes are more likely to select and move between reefs because of reduced travel costs and predation risks with shorter inter-reef distances. Alevizon et al. (1985), Matthews (1985), and Solonsky (1985) provided some support for this model by showing high movement rates to artificial reefs when distances to natural reefs are short.

Population Limitation.—Increased production should be more important for habitat-limited than recruitment-limited species. Both limitations have been demonstrated, although little agreement exists about the species and conditions under which these two factors operate. The ecological literature shows that evidence supporting reef fish habitat-limitation is not as strong as once thought and its acceptance not as widespread as in the past. Even where habitat is limiting, the amount of added artificial reef material may not be significant to population size or economically justified. Huntsman (1981) concluded that although artificial reefs were useful for increasing recreational opportunities, they were impractical for increasing commercial catches because reefs were expensive and time consuming to build and could only provide a small amount of additional habitat relative to available natural habitat. He noted that only four acres of artificial reefs had been constructed in South Carolina after several years of effort. This addition was insignificant relative to the existing natural reef habitat. Ambrose and Swarbrick (1989) suggest similar results for California.

Fishery Exploitation.—Fishery exploitation is likely to significantly affect habitat limitation and production by artificial reefs. Populations exploited at MSY, with approximately half the virgin standing stock biomass of an unexploited stock, should have greatly reduced competition and resource limitation. Overfished

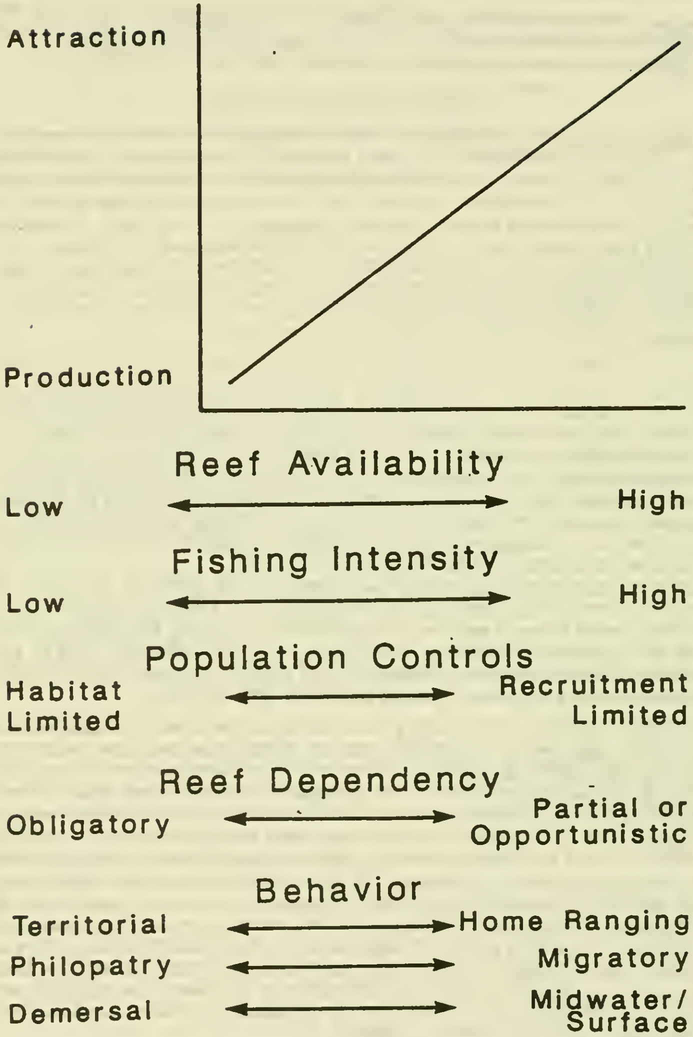

Figure 2. Gradients predicted to be important for attraction or production of fishes at artificial reefs. Linear responses are shown only for illustration purposes.

populations should have even less competition and resource limitation. By definition, recruitment overfishing implies recruitment limitation. Thus, when overfishing occurs, artificial reefs are less likely to increase production. On the other hand, there is no evidence that exploited populations will necessarily be more attracted to artificial reefs.

Life History and Behavior.—Ontogenetic changes and life history have been shown to be important factors. Reef dependency and site attachment varies between species and with age (size) for some species (Sale, 1969). Artificial reefs are unlikely to increase abundance or biomass if bottlenecks to population growth occur in non-reef habitats, or during life history stages not dependent on reefs. For example, reefs designed primarily for adult fishes may not increase production for species that recruit to other habitats, such as many commercially and recreationally important species (e.g., snapper, grouper, grunt, barracuda) that first settle in sand, sea grasses, mangroves, and estuaries. However, suitable enhancement of those habitats may be beneficial.

Production enhancement is more likely for highly territorial, philopatric, and obligatory reef species (e.g., damselfish) that are most likely to be habitat-limited. Attraction should be more important for gregarious, roaming, or facultative reef species (e.g., jacks, barracuda) with less substrate attachment and site dependency because these species are more able to select habitats. Similarly, production enhancement should be more important for demersal species, which are ecologically more closely tied to the benthos, than for surface and midwater pelagic species.

Tests of Predictions.—Polovina and Sakai (1989) provided an independent, partial test for some predicted gradients. Increased production was demonstrated for *Octopus dofleini*, an obligatory demersal reef species that is territorial, philopatric, and has low mobility (Hartwick et al., 1978). In contrast, artificial reefs primarily attracted flatfishes which are more mobile, less territorial, facultative reef species with low philopatry. The octopus appeared also to be habitat-limited while the flatfishes showed some evidence of recruitment-limitation with temporal year class variations independent of habitat availability.

Management Implications

Understanding the extent to which artificial reefs attract or increase fish biomass is important for wise fishery management and the effective construction and deployment of artificial reefs. The relative importance of these two possibilities has not been determined for most species and locations. However, even if artificial reefs primarily redistribute existing fishes, they can still be useful fishery management tools for increasing catchability, making fishes easier to locate, retaining highly migratory species in the local area, and moving stocks closer to fishing ports. Attraction is no problem where (a) fishing effort is low, (b) a large stock reservoir exists relative to catch, (c) fish density is too low to be efficiently fished without artificial reefs, (d) high rates of stock immigration exist, or (e) little natural reef habitat exists. However, while a few reefs can concentrate a stock, too many reefs could again dilute the stock or may not be economically justified.

Artificial reefs may not be effective for increasing fish biomass under some circumstances and enthusiasm for them may detract from more productive management approaches. Artificial reefs may not increase production of recruitment limited populations. If artificial reefs primarily attract fishes, they may not increase total biomass and can even accelerate stock depletion by increasing catchability, especially under heavy fishing pressure. Artificial reefs are unlikely to increase biomass for intensely exploited or overfished populations without other management actions. Interestingly, the incentive to build artificial reefs is most likely to increase when signs of overfishing occur. Under these circumstances other management actions may be needed in addition to, or instead of, building artificial reefs.

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DATE ACCEPTED: June 1, 1988.

ADDRESS: *Miami Laboratory, Southeast Fisheries Center, NOAA/National Marine Fisheries Service, 75 Virginia Beach Drive, Miami, Florida 33149.*

ATTACHMENT 2

ARTIFICIAL REEF DEVELOPMENT CENTER

1010 Massachusetts Avenue, N.W. (Suite 100), Washington, D.C. 20001 (202) 898-0770

ARDC BIBLIOGRAPHY SEARCH: RIGS-TO-REEFS

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